CHAPTER 2
FORESTWIDE MANAGEMENT POLICIES

INTRODUCTION

This chapter contains management policies for each of the major resource or land use categories affected by the plan: fish and wildlife habitat, recreation, subsurface resources, materials, timber, and transportation. The chapter also presents management policies for several specific land management concerns: cultural resources, tourism, forest protection, grazing, lakeshore management, private land, public access, scientific resources, stream corridors, and trails. These policies apply to state-owned land within the Tanana Valley State Forest.

The policies in this chapter consist of goals and management guidelines. Goals are the general condition the department is trying to achieve, while guidelines are specific directives that will be applied to management decisions as resource use and development occur.

This chapter also summarizes how this plan affects the management of certain resources: fish and wildlife habitat, recreation, subsurface resources, timber, transportation, cultural resources, scientific areas, riparian areas, and trails.

The following definitions and abbreviations apply to terms and agencies commonly referred to in this chapter. Additional definitions are in Appendix A.

> Consultation: Under existing statutes, regulations and procedures, the Department of Natural Resources informs other groups of its intention to take a specific action(s) and seeks their advice or assistance. Consultation is not intended to be binding on a decision; it is a means of informing affected organizations and individuals about forthcoming decisions and getting the benefit of their expertise.
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> Feasible: Capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, technical, and safety factors.
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> Feasible and Prudent: Consistent with sound engineering practice and not causing environmental, social, or economic problems that outweigh the public benefit to be derived from compliance with the standard which is modified by the term "feasible and prudent".
> Goal: A general statement of intent, usually neither quantifiable nor having a specified date of completion. Goals identify desired long-range conditions.
> Guideline: A specific course of action that must be followed when a resource manager permits, leases, or otherwise authorizes use of state lands. Some guidelines state the intent that must be followed and allow flexibility in achieving it. Guidelines also range from giving general guidance for decision-making or identifying factors that need to be considered to setting detailed standards for on-the-ground decisions.

Policy: An intended course of action or a principle for guiding actions. In this plan, DNR policies for land and resource management include goals, management intent statements, management guidelines, planned activities, implementation plans and procedures, and various other statements of DNR's intentions.

Shall: Requires a course of action or set of conditions to be achieved. A guideline modified by the word 'shall' must be followed by resource managers or users. If such a guideline is not complied with, a written decision justifying the noncompliance is required (see Chapter 4, Finding of Incompatibility).

Should: States intent for a course of action or set of conditions to be achieved. A guideline modified by the word 'should' states the plan's intent and allows a resource manager to use discretion in deciding the specific means for best achieving the intent or whether particular circumstances justify deviation from the intended action or set of conditions. A guideline may include criteria for deciding if such a deviation is justified.

Will: Same as 'shall' (above), however, when the word 'will' refers to a planned management activity by DNR or another agency, the carrying out of this activity is contingent on available funding.

Agency abbreviations are listed below:

ADF&G: Alaska Department of Fish and Game.
DEC: Alaska Department of Environmental Conservation.
DGGS: DNR Division of Geological and Geophysical Surveys
DMLW: DNR Division of Mining, Land, and Water
DNR: Alaska Department of Natural Resources.
DOF: DNR Division of Forestry
DOT/PF: Alaska Department of Transportation and Public Facilities.
DPOR: DNR Division of Parks and Outdoor Recreation.
FNSB: Fairbanks North Star Borough.
NRCS: Natural Resources Conservation Service
SHPO: DNR State Historic Preservation Office
USDA: United States Department of Agriculture.
USFWS: United States Fish and Wildlife Service

CULTURAL RESOURCES

I. GOAL

A. Cultural Resources

The Alaska Historic Preservation Act establishes the state's basic goal: to preserve, protect, and interpret the historic, prehistoric, and archeological resources of Alaska.

II. MANAGEMENT GUIDELINES

A. Cultural Resource Identification

DNR identifies and determines the significance of cultural resources in the Tanana Valley State Forest through:

1. Cultural resources surveys conducted by DNR personnel.
2. Encouragement of research on cultural resources within the Tanana Valley State Forest by qualified individuals and organizations.
3. Cooperative efforts between state, federal, and Native groups for planned surveys and inventories.

B. Cultural Site Protection. Protect cultural resources through the following actions:

1. Review proposed land uses and management activities for potential conflicts with cultural resources values.

2. Cooperate with concerned government agencies, Native corporations, statewide or local groups, and individuals to develop guidelines and recommendations on how to avoid or mitigate identified or potential conflict.

C. Cultural Resources in Timber Management Areas. The Division of Parks and Outdoor Recreation Office of History and Archaeology (OHA) will review proposals for timber management activities through the interagency review processes for the Five-Year Schedule of Timber Sales and Forest Land Use Plans for individual sales. Areas of known historic, archaeological, or paleontological sites should not be disturbed. Timber operations shall not occur within 300 feet from the boundaries of known sites unless the OHA determines, in consultation with the Division of Forestry, that certain activities can occur without significantly impacting the cultural resource. The OHA shall, within the limits of staffing and finding, assess the extent and significance of the cultural resource and work with Division of Forestry to develop site-specific mitigation measures to protect the heritage sites while allowing timber management.

D. Report Cultural Sites when Found. The Alaska Heritage Resources Survey (AHRS) is an inventory of all reported historic and prehistoric sites within the State of Alaska and is maintained by the Office of History and Archaeology (OHA). The AHRS is used to protect cultural resource sites from destruction. By knowing of possible cultural remains prior to the start of a project, efforts can be made to avoid project delays

and prevent destruction of cultural sites. While over 22,000 sites have been reported within Alaska, this is probably only a very small percentage of the sites which may actually exist but are as yet unreported. The AHRS is not complete or static, so cultural sites, when found, should be reported to OHA.

III. ACTIVITY SUMMARY

This plan lists cultural sites within the Tanana Valley State Forest (Table 1). DPOR's Office of History and Archaeology (OHA) has more information on the type and location of each of these sites, so that impacts on them may be avoided or mitigated. The sites are identified by number, rather than by name or location, in order to protect them from vandalism.

Table 1. Cultural sites identified within the Tanana Valley State Forest.

Unit	Cultural Site Code
2D	FAI-240, 251
2E	FAI-621, 622, 623
4C	FAI-435
4D	FAI-13, 95, 75, 8
5B	FAI-217
5C	FAI-437, 438, 215, 216
5D	FAI-29
7A	XBD-27, 67, 128
7B	XBD-127, 28, 168, 169, 176, 175, 65, 11
7C	XBD-168, 169, 42, 11, 124, 12, 13, 4
8A	XBD-124, 12, 13, 4, 172, 173, 14, 15, 71, 63
8B	XBD-124, 12, 13, 4
10A	XBD-75, 81, 74, 77
10C	XBD-163
11	XBD-23, 24
12A	Tanacross-2
Proposed addition C8B	XBD-56, 58, 10, 6, 165, 166, 167, 157
Proposed addition C8C	XBD-17

FISH AND WILDLIFE HABITAT

I. GOALS

A. Wildlife Management Objective

Manage the Tanana Valley State Forest consistent with the Forest Resources and Practices Act, which states, "The wildlife management objective of the Tanana Valley State Forest is the production of wildlife for a high level of sustained yield for human use through habitat improvement techniques to the extent consistent with the primary purpose of a state forest...." (AS 41.17.400(e)).

B. Manage Habitat Base

Manage the habitat of sufficient suitable lands and waters to provide for the diverse habitat needs of fish and wildlife resources to maintain or enhance public use and economic benefits while maintaining the natural range of species and habitat diversity of the Tanana Valley State Forest.

C. Ensure Access to Public Lands and Waters

Ensure access to public lands and waters where appropriate to promote or enhance responsible public use and enjoyment of fish and wildlife resources. Access improvements should be designed to match the public use objectives for the area under consideration. See also guidelines in the Public Access section of Chapter 2.

D. Mitigate Habitat Loss

When resource development projects occur, reduction in the quality and quantity of fish and wildlife habitat shall be mitigated, following the steps set forth in Management Guideline I, and using proven fish or wildlife habitat enhancement techniques where appropriate.

E. Contribute to Economic Diversity

Protect and enhance fish and wildlife resources and habitats to contribute directly or indirectly to local, regional, and state economies through commercial, subsistence, sport, and nonconsumptive uses.

F. Improve Wildlife Habitat

Enhance the value of habitat to fish and wildlife species through water control projects or through vegetation manipulation, including burning, crushing, timber harvest, and other management practices.

II. MANAGEMENT GUIDELINES

A. Activities in Important Waterfowl Habitat

In important waterfowl habitat, activities that require a permit, lease, or development plan, and produce high levels of acoustical or visual disturbance from sources such as boat traffic, blasting, dredging, and seismic operations, will, to the extent feasible and

prudent, be avoided during sensitive periods. Where it is not feasible and prudent to avoid such activities, other mitigative measures will be considered to attempt to avoid significant impacts. The ADF&G will be consulted for assistance in identifying areas of important waterfowl habitat and any appropriate mitigation techniques.

B. Dredge and Fill in Important Waterfowl Habitat
Permits for dredging and filling in important waterfowl habitat, including permits for gravel extraction and construction of roads and pads, will not be granted unless it is determined that the proposed activity will not cause significant adverse impacts to important waterfowl habitat or that no feasible and prudent alternative exists. Where dredging or filling does occur, other mitigative measures will be considered to attempt to avoid significant impacts. Dredge and fill of wetlands is also regulated by the Army Corps of Engineers.

C. Structures in Fish Habitat
Structures in fish-bearing waters shall be designed, constructed, and maintained to comply with the requirements of AS 16.05.840-.860 & .870-.890 to minimize impacts on fish migration, spawning, and rearing.

D. Water Intake Structures
When issuing appropriations for waters that provide fish habitat, DNR will require that practical water intake structures be installed that do not entrap, entrain or impinge fish. The most simple and cost-effective technology may be used to implement this guideline. When significant adverse effects cannot be avoided by design, siting, timing, or other management options, the adverse effect of the use or development shall be mitigated.

Water intake structures will be screened and intake velocities will be limited to prevent entrapment, entrainment, or injury to fish. The structures supporting intakes should be designed to prevent fish from being led into the intake. Other effective techniques may also be used to achieve the intent of this guideline. Screen size, water velocity, and intake design will be determined in consultation with the ADF&G.

E. Threatened and Endangered Species
All land use activities should be conducted consistent with state endangered species statutes (AS 16.20.180--.210) and the federal Endangered Species Act to avoid jeopardizing the existence of threatened or endangered species of fish or wildlife or their use of an area, and to avoid modification or destruction of their habitat.

No species listed as endangered by the State of Alaska or the U.S. Fish and Wildlife Service (USFWS), or as threatened by the USFWS, currently occur in the Tanana Valley State Forest. Two falcon species were recently removed from the federal endangered species list. Arctic peregrine falcons may occur in the Forest, but only during migration. American peregrine falcons nest at a number of sites along the Tanana River and its tributaries in the Tanana Valley State Forest.

The State of Alaska Species of Special Concern list (maintained by the Commissioner of ADF&G) contains six species that occur within the Tanana Valley State Forest: Arctic peregrine falcon (*Falco peregrinus tundrius*), American peregrine falcon (*Falco peregrinus anatum*), Olive-sided flycatcher (*Contopus cooperi*), Gray-cheeked thrush (*Catharus minimus*), Townsend's warbler (*Dendroica townsendi*), and Blackpoll warbler (*Dendroica striata*).

Land use activities that could potentially affect State endangered species, or species of special concern, will be identified as part of interagency consultations during review of forest land use plans or other land use plan or permit actions.

F. Eagles

Activities that potentially affect bald and golden eagles will be consistent with the Bald Eagle Protection Act of 1940 as amended. For activities within ¼ mile of known bald or golden eagle nest sites, refer to the bald eagle land management practices for Alaska. Current guidelines and locations of nests, as well as technical advice on conducting activities near eagle nest sites, should be obtained from the Fairbanks Ecological Services office of the USFWS. The recommended practices are designed to prevent human disturbance to eagles, particularly during the nesting season. Specific activities that are likely to cause disturbance to eagles include major land uses such as logging, the development of new commercial and industrial sites, mining, and road construction. During the critical nesting period, human activities such as human entry into the primary nesting zone (330 feet from the nest) and low-level aircraft operations may also cause disturbance to eagles.

Although peregrine falcons are no longer listed under the federal Endangered Species Act, the USFWS encourages the continued conservation of these species by applying protection measures during the nesting period. The recommended protection measures, as well as technical advice on conducting activities near peregrine falcon nest sites, can be obtained from the Fairbanks Ecological Services office of the USFWS. Activities that may disturb nesting peregrines are low-flying aircraft, other noisy activities, ground level activities, and construction near nest sites during critical nesting times. In addition, activities that could have negative impacts throughout the year (not only during nesting periods) include habitat alterations, construction of permanent facilities, and pesticide use.

G. Habitat Enhancement

Habitat manipulation through burning, water control, timber management practices, or other measures may be used to improve habitat for certain fish and wildlife species where feasible and compatible with other primary uses. Enhancement practices will not result in significant conflicts with a subunit's primary management intent.

H. Trumpeter Swans

Where feasible and prudent, all land use activities in or near trumpeter swan nesting habitat, including the granting of leases or permits, will be conducted to avoid disturbance to swans or detrimental alteration to the habitat. Leases or permits may

include seasonal restrictions on activities to avoid disturbance to swans. Consultation with ADF&G will be used to identify current or potential nesting habitat and to determine guidelines to follow and activities to avoid. Construction of transmission lines in trumpeter swan habitat should be avoided. If transmission lines are constructed they should be sited in forested areas and kept close to treetop level, and wires should be strung in one horizontal plane rather than in multiple, vertical stacks. Where wires cross rivers, marshes, and other open spaces, they should be marked to make them visible to swans.

I. Mitigation

1. When authorizing the use or development of state lands, the Department of Natural Resources and the Department of Fish and Game will evaluate the requirements of the activity or development and the benefits or impacts it may have to habitat when determining stipulations or measures needed to protect fish and wildlife or their habitats. The costs of mitigation relative to the benefits to be gained will be considered in the implementation of this policy.

2. All land use activities should be conducted with appropriate planning and implementation to avoid or minimize foreseeable or potential adverse effects on fish and wildlife populations or their habitats.

3. The department shall enforce stipulations and measures, and shall require the responsible party to remedy any significant damage to fish and wildlife or their habitats that may occur as a direct result of the party's failure to comply with applicable law, regulations, or the conditions of the permit or lease.

4. When determining appropriate stipulations and measures, the department will apply, in order of priority, the following steps. Mitigation requirements listed in other guidelines in this plan will also follow these steps.

    a. Avoid anticipated, significant adverse effects on fish and wildlife or their habitats through siting, timing, or other management options.

    b. When significant adverse effects cannot be avoided by design, siting, timing, or other management options, the adverse effect of the use or development shall be minimized.

    c. If significant loss of fish and wildlife habitat occurs, the loss shall be rectified, to the extent feasible and prudent, by repairing, rehabilitating, or restoring the affected area to a functional state.

    d. DNR will consider requiring replacement or enhancement of fish and wildlife habitat when steps "a" through "c" cannot avoid substantial and irreversible loss of habitat. The Department of Fish and Game will clearly identify the species affected, the need for replacement or enhancement, and the suggested method for addressing the impact. Replacement or enhancement of similar habitats of the

affected species in the same region is preferable. DNR will consider only those replacement and enhancement techniques that have either been proven to be, or are likely to be, effective and that will result in a benefit to the species impacted by the development.

Replacement or enhancement will only be required by DNR if it is determined to be in the best interest of the state either through the original AS 38.05.035(e) process or a permit review process. Replacement may include structural solutions such as creating spawning or rearing ponds for salmon, creating wetlands for waterfowl, or non-structural measures such as research or management of the species affected, legislative or administrative allocation of lands to a long-term level of habitat protection that is sufficiently greater than that which they would have otherwise received, or other management practices to increase habitat productivity.

III. ACTIVITY SUMMARY

Although all lands within the State Forest serve as fish and wildlife habitat to some degree, the DNR will manage especially important habitat lands to maintain fish and wildlife production and related public use.

A. Fish

Waterbodies within the State Forest support a number of significant commercial, subsistence, sport, and personal use fisheries. Fish habitat and fisheries conservation (catch, harvest, and release) values are of primary importance within and immediately upland of streams and lakes containing anadromous and high value resident fish species. Special Management Zones have been designated along many waterbodies in part to protect important spawning and rearing habitat and resident fish populations (see the Riparian and Instream Flow Management section of this chapter). Within these zones, development activities will be permitted only if they can be shown to have minimal impact on the fish habitat and water quality or they can be shown to be of overriding public benefit. (See the mitigation section on the previous pages.)

B. Wildlife

Land in the Tanana Valley State Forest provides habitat for moose, caribou, bears, furbearers, raptors, waterfowl, and other animals. Wildlife resources are used by tourists and residents for hunting, trapping, and nonconsumptive uses, such as viewing. Timber harvest and other development activities will be designed to mitigate adverse impacts on important wildlife species and habitats.

Pursuant to AS 41.17.400(e), ADFG's Division of Wildlife Conservation may manipulate various tree species (spruce, willow, paper birch, aspen, and balsam poplar) in or near the State Forest to increase available moose browse and begin staggered rotations of hardwood forest beneficial to ruffed grouse and other early- to mid-successional wildlife species. Examples of techniques that may be used are: tractor crushing of riparian willow and bulldozer shearblading or felling of hardwoods. ADFG and DOF monitor these

treatments for habitat benefits and cost-effectiveness. Habitat enhancement projects will be listed in the Five Year Schedule of Timber Sales or by some other public process.

The proliferation of shrubs and deciduous tree saplings that can occur after timber harvest in mature coniferous forests of the Interior may be of high quality for moose. Based on vegetation responses observed after fire in the boreal forest, any increase in nutritional quality or palatability of new growth for moose might be temporary. However, a significant increase in the availability of browse is usually maintained for 20 to 30 years after harvest, especially where browsing pressure is heavy enough to slow stand succession toward mature forest. The amount of browse produced for moose depends on many factors, including stand characteristics, silvicultural practices, and the harvest system.

GRAZING

I. GOAL

Provide land for grazing within the Tanana Valley State Forest while maintaining or enhancing the productive capability of the soil and protecting or enhancing the quality of the natural environment.

II.MANAGEMENT GUIDELINES

A. Improved pasture grazing may be allowed in the State Forest provided that the following criteria are met:

1. Improved pasture grazing is shown to be consistent with the management intent of the area.
2. Resulting activities will not cause access problems such as blocking trails or restricting access to public lands. If an area is fenced, gates are generally required to allow trail access. Even where trails are not present, gates are often required at specific points. Restrictions would be noted in the Range Management Plan or Grazing Operations Plan.
3. A statement is obtained from the USDA Natural Resources Conservation Service indicating that the soils are suitable without draining for improved pasture grazing.
4. Fencing of the area will generally be required. Riparian habitat adjacent to waterbodies with public recreation values of regional or statewide significance, habitat values, or watershed values shall be protected by fencing, unless other feasible and prudent methods are found.
5. At the discretion of DNR, in consultation with ADF&G, all improvements must be removed when the lease is terminated.
6. DEC recommendations regarding possible nonpoint source pollution problems are addressed.
7. Livestock feedlots are prohibited.
8. All activities are subject to a range management plan (depending on scale) or a grazing operation plan (see E and F in this section).

B. Grazing in key habitats

Grazing will be prohibited in Dall sheep and high-value grizzly bear habitats. In other areas, grazing will be permitted on a case-by-case basis if consistent with the management intent of the area, and after consultation with ADF&G concerning disease and habitat risks to local wildlife populations.

C. Multiple Use Management of Grazing Lands

1. Grazing lands will be managed as multiple use lands to support a variety of public benefits in addition to livestock production, including:

- Fish and wildlife habitat

- Water quality
- Public recreation
- Timber
- Soil conservation
- Oil and gas

2. Grazing lands will be managed to ensure sustainable forage for domestic stock and wildlife.

3. Public access across and public use of grazing lands may not be limited by persons holding grazing leases or permits unless approved as part of a grazing operations plan.

D. Grazing Permits and Leases
A grazing lease or permit issued by DNR is required for any person who releases livestock on state lands. Permits may be issued for 5 years. Short-term leases may be issued for up to 10 years. Permits may be issued wherever grazing is not prohibited as long as fish and wildlife and other significant resources or uses are not adversely affected.

1. Permits or short-term leases, rather than long-term leases, should be issued in areas especially susceptible to soil erosion or water quality degradation, environmentally sensitive areas, areas with potentially conflicting uses, or areas where the level of activity and investment by the lessee does not require a long-term commitment of the land. These areas will be identified through DNR's range management plans.

2. Long-term leases may be issued where grazing is a designated use and where the level of activity and investment by the lessee is significant enough to require a long-term commitment of the land. Long-term leases will establish reasonable utilization standards that, if not met, may be cause for cancellation of the lease.

Long-term leases may be issued unless the best interest finding determines that significant impacts to important fish and wildlife or other resources and uses cannot be adequately mitigated in the terms and conditions of the lease.

3. The requirements stated in these guidelines will be implemented through appropriate lease and permit stipulations. In addition, standards in permits or leases will follow the fencing guidelines developed cooperatively by the DNR, NRCS, and ADF&G to minimize impacts to fish, wildlife, and recreation uses.

E. Range Management Plans
Where grazing is anticipated to be a significant, widespread land use with potential for creating environmental harm, DNR will develop range management plans (RMP) before issuing grazing leases or permits in consultation with ADF&G, NRCS, DEC, and Soil and Water Conservation Districts. The provisions of RMPs will provide the basis of approval of grazing operations plans (see below) and of stipulations to be included in grazing leases and permits. RMPs will not be required where grazing is a minor use with

few animals and little land area involved. DNR will determine where range management plans are appropriate based on consultation with other affected agencies, including ADF&G. RMPs shall minimally address the following items:

1. Stocking Densities. The state shall use standard USDA range assessment procedures or other scientifically acceptable methods to identify the abundance, distribution, annual productivity, nutrition, and seasonal availability of range vegetation available for grazing. Forage availability, expressed as animal unit months (AUMs), shall be used with proposed grazing schedules to establish maximum allowable stocking densities, with consideration for meeting wildlife forage requirements, that will provide sustained range production and condition.

2. Water Quality Protection. Range management plans will state how anadromous fish streams, other waterways, and lakes will be protected from adverse impacts of grazing. Fencing may be required to protect portions of waterbodies. Identification of specific watering sites, feeding stations, headquarter sites, or other improvements may be required to minimize the adverse impacts of grazing.

3. Annual Grazing Schedule. Range management plans will establish spring and fall dates for release and removal of stock on grazing lands. This may be necessary to protect the range and to minimize competition between stock and wildlife.

4. Map of Proposed Grazing Areas. Range management plans will include a map that shows the location, acreages, and configurations of proposed lease and permit areas.

5. Physical Improvements. Range management plans will show proposed stock watering sites, supplemental feeding stations, farm headquarters sites, fences, and other improvements necessary to minimize conflicts between grazing and other resource values. Range management plans shall include, where appropriate, guidelines for the design, location, or use of roads, trails, bridges and other improvements or actions that may be necessary or incidental to grazing operations.

6. Environmental Monitoring. Range management plans will establish procedures to monitor the impacts of grazing on wildlife, vegetation, and soil stability and establish conditions under which a lessee's or permittee's grazing operations plan may be modified to prevent environmental degradation.

7. Disease Transmission and Livestock Predator Conflicts. Range management plans will establish measures necessary to minimize transmission of disease between domestic stock and wildlife and to minimize livestock predator conflicts.

8. Modification of Vegetation. Artificial modification of natural vegetation such as clearing, burning, crushing, or seeding will be permitted only in the locations and under the guidelines specified by applicable range management plans.

F. Grazing Operations Plan

A grazing permit or lease will not be issued without an approved grazing operations plan. DNR will assist a lessee or permittee in plan preparation with the consultation of ADF&G and NRCS. Minimum requirements of a grazing operations plan are listed below:

1. Cooperative agreement between the lessee and the appropriate Soil and Water Conservation District.

2. A physical resource map that identifies location, acreage, and configuration of the proposed lease or permit area; stock watering sites, and supplemental feeding stations; and farm headquarters sites, outbuildings, fences, and other proposed improvements.

3. A statement of the lessee's proposed management activities that includes range management practices considered essential or desirable, including clearing and modification of vegetation; livestock species to be stocked; annual grazing schedule; and a forage balance sheet.

4. Proposed stocking densities. A maximum stocking density will be based on DNR's range management plan for the area concerned (if such a plan exists). A minimum stocking density with a schedule for achieving it will also be established as a part of each grazing operations plan to ensure efficient use of state grazing land.

G. Standards of Approval for Grazing Operation Plans

A grazing operations plan will be approved only when it complies with an applicable range management plan. In areas where no range management plan exists, approval will be based on consideration of the potential effects of grazing on vegetation, water quality, riparian lands, soil stability, disease transmission, livestock-predator conflicts, and competition between wildlife and stock for forage. DNR, in consultation with affected agencies, may require that appropriate measures be specified in a grazing operations plan to minimize adverse impacts.

H. Modifications of Grazing Operations Plan

Modifications of grazing operations plans may be required if grazing activities are determined to cause significant degradation to the range or wildlife habitat, including water quality, soil stability, or sustainable forage for stock and wildlife. Determination that modification of a grazing operations plan is necessary will be made by DNR in consultation with the lease or permit holder, DEC, and ADF&G.

III. ACTIVITY SUMMARY

No grazing is currently occurring in the State Forest.

PRIVATE LAND

The Tanana Valley State Forest adjoins private land owned by Native corporations, Native allottees, and other individuals. In some areas, past state subdivisions abut the State Forest. Private owners may be affected by forest management activities and forest access.

I. GOAL

Minimize negative impacts of State Forest activities on adjacent private land.

II. MANAGEMENT GUIDELINES

Resource Development Near Private Land

Timber, recreation, road, and other development activities near private land (which includes Native allotment and other Native lands) will be designed to avoid conflicts with landowners to the extent feasible and prudent. DNR Division of Forestry will consider using selective harvest or other partial cutting techniques within 200 feet of private land and consider potential impacts of roads on adjacent private land when planning forest road locations. During the public review process for the proposed activity, DNR will attempt to contact all private landowners whose land adjoins a proposed timber sale area, road, or other state-initiated development project.

PUBLIC ACCESS

I. GOALS

Maintain, enhance, or provide adequate access to publicly-owned land and resources.

II. MANAGEMENT GUIDELINES

A. RS 2477 Trails

In 1998, the Legislature enacted AS 19.30.400-420, which states that the State claims, occupies, and possesses each right-of-way granted under former 43 USC 932 (RS 2477) that was accepted either by the State, the territory of Alaska, or by public users. The statute lists 602 RS 2477 routes, providing notice to the public of their existence and vesting management authority for these rights-of-way with DNR.

The statute requires DNR to report annually to the legislature on RS 2477 routes that have been added to the list of 602 routes. The statute also says that failure to identify or include a right-of-way on the list of routes does not relinquish any right, title or interest the public has in a right-of-way under RS 2477. Accordingly, there may be more routes in the TVSF than are currently identified.

The following RS 2477 rights-of-way are within the TVSF. The prescribed width for each right-of-way is 100 feet (50 feet each side of centerline) under AS 19.10.015.

Table 2. RS 2477 trails

RST #	Trail Name	Unit(s) trail crosses
RST 66	Dunbar-Brooks Terminal	Unit 3B, 4D
RST 152	Nenana-Tanana (Serum Run)	Unit 2D, 2E
RST 70	Ester-Dunbar	Unit 5A
RST 188	Slana-Tanana Crossing	Unit 14
RST 264	Old Mail Trail (Nenana-Minto)	Unit 2E
RST 322	Salcha-Caribou Sled Road	Unit 7B
RST 333	Tanana Crossing –Grundler	Unit 10A, 10C, 11, 12A, 12B
RST 379	North Fork Fortymile – Big Delta	Unit 9A
RST 391	Tanacross – Ketchumstuck	Unit 12A
RST 449	Goodpaster River Trail	Unit 9A
RST 500	Michigan Creek Trail	Unit 11
RST 688	Lake George Trail	Unit 10C
RST 1595	Dunbar-Minto-Tolovana	Unit 2E, 4D
RST 1598	Chena Lakes Trail	Unit 6

B. Retain Access

The state will improve or maintain public access to the Tanana Valley State Forest by retaining access sites and corridors in public ownership, reserving rights of access when state land is leased adjacent to the State Forest, acquiring access, or identifying RS 2477 rights-of-way. Generally, section line easements should not be vacated on land within or

adjacent to the State Forest unless reasonable alternative access can be established. Within the State Forest, DNR will reserve public access across areas leased for private use.

C. Management of 17(b) Easements
17(b) easements are public easements through Native Corporation land. The Bureau of Land Management manages 17(b) easements. Generally, DNR will not accept management of 17(b) easements unless it already actively manages a portion of the trail or easement, or unless state management will best protect public access to state lands. The DNR Division of Mining, Land and Water manages RS 2477 routes where they coincide with 17(b) easements.

D. Access for Development
When an access route is constructed for resource development, existing public access will not be displaced or rendered unusable by new construction. Various uses of resource development roads shall not restrict the purpose for which the roads were constructed.

E. Public Access Rights
Where feasible and within the limits of available funding, full public rights of access should be provided when roads are constructed by state or local governments for purposes other than forest operations. Perpetual exclusive easements should be acquired and recorded when the state acquires access rights across property in other ownerships adjacent to the State Forest.

F. Coordination with the Department of Transportation and Public Facilities (DOT/PF)
Access needs, such as right-of-way widths or road locations, should be coordinated with DOT/PF.

G. Limiting Access
Access to land within the State Forest may be curtailed at certain times to protect public safety, allow special uses, and prevent harm to the environment. Examples of conditions that may justify limiting public access are fire management, timber harvest operations, and high soil moisture content when traffic may cause extensive damage to roads and trails.

Existing statutes address restrictions of easements and rights-of-way use (AS 38.04.058), and restrictions of traditional means of access (AS 38.04.200). These and subsequent statutes and regulations must be considered when contemplating use restrictions.

H. Access Along and Across the Trans-Alaska Pipeline (TAPS)
On state land, access is allowed across and along the TAPS under the following conditions:

1. Crossing on foot or by vehicles of less than 1,500 lbs. gross vehicle weight (GVW) is allowed without a permit.

2. Crossing by vehicles, pickups, four-wheel-drive vehicles, and all-terrain-vehicles over 1,500 lbs GVW requires a permit except at designated vehicle crossings.
3. The public may not travel on the TAPS right-of-way parallel to the pipeline except by permit from the DNR State Pipeline Coordinator's Office.

I. Pipeline Access Roads
DNR should work with Alyeska Pipeline Service Company to open or move barrier gates temporarily or permanently on certain access roads that cross state land between the Richardson and Elliot Highways and the pipeline right-of-way. Such an arrangement would allow the public more access to state land along service roads and within the State Forest.

J. Pipeline Crossings
DNR should work with Alyeska Pipeline Service Company to identify options to develop new pipeline crossings. Future pipelines (such as the Trans-Alaska Gas Line) should provide more places for public crossings to state land for hunting, fishing, recreation, timber harvest, settlement, and other uses or provide a mechanism to improve or develop future public crossings as the need arises.

RECREATION

I. GOALS

A. Recreation Opportunities.
Alaska's abundant and diverse recreation resources are one of the major attractions for living in the state. Residents will continue to demand high quality, accessible recreation opportunities.

The Tanana Valley State Forest will be managed for multiple use, consistent with the purpose of the establishment of the State Forest (AS 41.17.200). The State Forest is one component of the mosaic of public land in the Tanana Valley that includes state and federal park land, as well as general state land that has been designated for recreation. Recreational use of the State Forest is recognized and protected in the state forest enabling legislation, AS 41.17.230(a). The State Forest will be retained in state ownership and managed to allow a range of activities to occur, including public recreation. The State Forest complements other public lands in the Tanana Valley because its roads and trails allow it to fill a different niche than other, less accessible, lands in the area. Many of the high-value recreation lands within the Tanana Valley are outside the State Forest, such as clear water rivers and alpine areas.

1. Allow and encourage a wide range of recreational uses of the State Forest. Forest lands will be managed to provide a range of recreation opportunities (see the Recreation Opportunities Matrix, Table 3)
2. Preference will not be given to one recreational use over another recreational use by restricting particular uses. The TVSF will be managed to allow people to pursue "generally allowed" (11 AAC 96) recreation activities. The Division of Forestry will use a variety of management techniques to resolve conflicts before invoking use restrictions. Use restrictions will require a finding of incompatibility (see Appendix B).
3. State Forest land management will not seek to duplicate opportunities provided by other public lands in the Tanana Valley, such as wilderness or highly-developed recreation areas.
4. Allow for the development of recreation areas, trails, rivers, and sites that provide a range of year-round outdoor opportunities for a variety of ages, abilities, and use preferences near population centers and major travel routes. Developments will be designed and located to be compatible with other uses.
5. Consult with communities on recreational plans.
6. Identify areas with recreation use. These areas are described in Chapter 3 on a unit-by-unit basis. Fishing and hunting activities are addressed in the fish and wildlife sections of Chapter 3.
7. Allow appropriate commercial development of recreational facilities and services through land leases and technical assistance where public recreation needs can most effectively be provided by private enterprise. (See also the Tourism section of this chapter.)

B. Recreation Resource Protection.
Alaska's natural and cultural resources are the foundation of Alaska's recreation opportunities and they must be protected.

1. Protect natural features of regional or statewide significance and preserve cultural features representing major themes in Alaskan history.
2. Prevent soil erosion, loss of fish and wildlife habitat, degradation of scenic and recreation areas, and loss of access to open space.
3. Allow for public education through the use of signs, interpretive trails, and programs to portray natural, cultural, and historic features and forestry practices.

C. Economic Development.
Alaska is an international recreation and tourism attraction. See the Tourism section in this chapter for the economic development goals that pertain to tourism and recreation.

II. MANAGEMENT GUIDELINES

A. Campgrounds and Other Recreational Facilities
Guidelines for the establishment and maintenance of campgrounds, boat launches, and other recreational facilities on State Forest land will be similar to those of facilities managed by the DNR Division of Parks and Outdoor Recreation on other state land. The Division of Forestry will adopt management regulations similar to DPOR's for these facilities. Construction of facilities is subject to available funding for both construction and maintenance.

B. Public Use Cabins
This plan identifies general locations for public use cabins in Chapter 4, Table 14, and for each unit in Chapter 3. The Five Year Schedule of Timber Sales or other public review process will identify specific locations where cabins will be constructed and maintained and will detail budget requirements. Cooperation will be sought with municipal or federal governments or nonprofit organizations for construction or maintenance of cabins. If cabins are constructed, DNR will develop administrative procedures for managing the state public use cabin program within the Tanana Valley State Forest.

Public use cabins will be sited to avoid conflicts with existing or planned resource uses such as private land use, and timber and mineral development. Construction of public use cabins is contingent on available funding for both construction and maintenance.

C. Private Commercial or Public Nonprofit Recreational Facilities
See the Tourism section in this chapter for the guidelines for construction of recreational and tourism facilities.

D. Private Recreational Facilities

DNR will not authorize the construction of cabins or other facilities, or the private use of existing unauthorized cabins for private noncommercial use in the State Forest. Demand for recreational cabin use will be provided for by public use cabins or by commercially operated facilities (see the Tourism section of this Chapter).

Use of cabins and land previously leased to private individuals under the Remote Cabin, Open-to-Entry, or other disposal program, is not affected by this policy.

E. Management of Sites
Management of recreation sites will maintain high quality recreation experiences, environmental quality, and safety.

F. Trails
See the Trails section of this chapter.

G. Waterbodies
See the Riparian and Instream Flow section of this chapter.

H. Scenic Values
Development activities, such as timber harvesting, will be sited, designed, and carried out to minimize adverse impacts to scenic values. Vegetation that obscures scenic vistas may be managed to facilitate viewing. Techniques to address scenic concerns are discussed in Management Guideline D. Management of Commercial Forest Types, and Guideline M., Silviculture and Harvest Practices, in the Timber Management section in Chapter 2. See also AS 41.17.060(c)(6) and 11AAC 95.820.

I. Information and Education
Interpretive signs, trails, and displays are encouraged to provide recreational and educational opportunities. Development of interpretive facilities will be addressed within the Five-Year Schedule of Timber Sales or other public review process and development will be subject to the available funding.

III. ACTIVITY SUMMARY

The availability of access affects the type and availability of recreation opportunities. Dispersed recreation activities occur throughout the forest, but are mainly concentrated along roads, trails, and river corridors. See the "Examples of Recreational Activities" row of the Recreation Opportunities Matrix (Table 3) for activities identified in the State Forest. The character of recreation opportunities will vary over time and shift to different locations depending upon access, timber harvest activities and other resource management activities. The opportunities described in the Recreation Opportunities Matrix (Table 3) will vary by type of access and by season and year, as access development and maintenance shifts within the forest. All-season recreation opportunities will change during the winter if the roads are not plowed. During the winter, if the roads are plowed, seasonal access areas may provide opportunities similar to those in all-season accessed areas. Encounters with resource development activities will vary over time and location. Current and anticipated primary access for TVSF units is found in Table 12, in the Transportation section of Chapter 2.

Management of the forest for multiple use, through shifting patterns of access, human use, resource development and vegetation types over time and space, will maintain a range of recreation opportunities. Where feasible, the Division of Forestry will manage timber harvest to enhance recreational activities.

The shores of streams, lakes, and rivers listed in Table 4 are designated Special Management Zones in part to maintain their recreation value (see the Riparian and Instream Flow Management section of this chapter).

The Eagle Trail State Recreation Site is the only developed facility within the State Forest. Other recreational facilities, including campgrounds, public use cabins, boat launches, waysides, interpretive sites, and trails, have been recommended for construction in the State Forest. Construction of these developments, however, is contingent upon funding for both construction and maintenance. Few developed recreation facilities are anticipated to be constructed in the State Forest in the next twenty years. Potential recreation facilities are listed in Chapter 4 in Table 14.

Table 3. Recreation Opportunities Matrix. Characteristics of recreation vary with access type.

	ACCESS TYPE			
RECREATION CHARACTERISTICS		**Units with Seasonal Access**	**Areas with All-Season Access**	**Developed Recreation Sites**
	Levels of Access	Accessible by highway vehicles only seasonally. Access is by all-weather roads that are unplowed in the winter, by winter roads that are not drivable in the summer, by trails that are not suitable for highway vehicles, or by boat.	All-weather roads connected to highway and maintained for year-round access.	Connected to highway system and maintained for access at least during high-use season.
	Human Use	Low to moderate use, varies seasonally.	Moderate use and encounters with other people.	Highest level of use and encounters with other people.
	Use Challenge and Risk	Moderate to high levels of challenge and risk. Requires medium to high skill for safety.	Low to moderate levels of challenge and risk. Requires low to medium skills for safety.	Low level of challenge and risk. Lowest level of skills needed.
	Examples of Recreational Activities	Fishing, hunting, boating, cross-country skiing, skijoring, snowmachining, dogmushing, hiking, trapping, canoeing, camping, berry picking, wildlife viewing, recreational mining.	Activities in seasonal access column, plus: Vehicle day use, biking, camping in campgrounds, bus tours, educational programs, vehicle camping, sightseeing.	Vehicle camping in developed campsites, picnicking, day-hiking on developed trails.

RIPARIAN AND INSTREAM FLOW MANAGEMENT

I. GOALS

A. Recreation

Provide opportunities for a variety of recreational activities within publicly owned stream corridors, including remote and developed recreational activities.

B. Fish and Wildlife Habitat and Use

Protect riparian fish and wildlife habitats and maintain existing human uses of fish and wildlife resources.

C. Water Quality

Protect water quality to standards established by DEC to support domestic uses, fish and wildlife production, and recreational activities.

D. Forest Products

Where consistent with the above goals, and with the Forest Resources and Practices Act, provide for the harvest of timber from riparian forests.

II. MANAGEMENT GUIDELINES FOR RIPARIAN ZONES

A. Forest Resources and Practices Act and regulations

The Forest Resources and Practices Act establishes, and provides standards for, riparian areas for forestry operations (AS 41.17.118(a)(1)). The Act (AS 41.17) and regulations (11 AAC 95) also establish best management practices to prevent adverse impacts from forestry operations on fish habitat and water quality.

B. Special Management Zones

A special management zone (SMZ) is an area near a stream or lake that will be managed primarily to protect or enhance recreational values, significant fish and wildlife habitat and human uses, and water quality. These special management zones include side channels, sloughs, and backwaters. See Table 4 for a list of waterbodies with designated SMZs.

The width of a SMZ will be determined on a case-by-case basis, depending on the particular values present in a riparian zone and the uses that are anticipated in that zone. In all cases, however, a SMZ will extend a minimum of 100 feet landward from the ordinary high-water mark of a lake or stream.

C. Uses Allowed in Special Management Zones

To the extent feasible and prudent, commercial and industrial uses, transportation facilities, and pipelines will be located outside of SMZs unless these uses are water dependent. Where it is not feasible and prudent to exclude these uses from SMZs, other measures will be implemented to meet the intent of these guidelines. Timber harvest may

occur in SMZs if it is sited and designed to be consistent with the primary recreation, fish and wildlife, and water-quality goals stated above.

All land use authorizations and management activities in SMZs shall provide for public access to and along public and navigable streamsides and lakeshores.

D. Alteration of the Hydrologic System
To the extent feasible, channelization, diversion, or damming that will alter the natural hydrological conditions and have a significant adverse impact on important riverine habitat will be avoided.

E. Soil Erosion
Soil erosion will be minimized by restricting the removal of vegetation adjacent to streams and by stabilizing disturbed soil as soon as possible.

F. Structures in Fish Habitat
See the "Structures in Fish Habitat" part of the Fish and Wildlife Habitat section of this chapter.

G. Water-intake Structures
See the "Water Intake Structures" part of the Fish and Wildlife Habitat section of this chapter.

H. Transportation Facilities in Floodplains
See the Transportation section of this chapter.

III. MANAGEMENT GUIDELINES FOR INSTREAM FLOW

A. Streams and Uses to Consider
Streams and other waterbodies should be considered for instream flow reservations when an identified need exists to support significant public purposes, or when the resource values of the stream are exceptional.

Under DNR's statutes, reservation of water for instream flow is possible for four types of uses:

1. Protection of fish and wildlife habitat, migration, and propagation. Instream flow reservations to protect habitat may be made for streams that have significant anadromous or resident fish populations; flow into wetlands that support significant waterfowl, furbearer or other wildlife populations; or provide the water supply needed for other habitat types that support significant wildlife populations.
2. Recreation and park purposes.
3. Navigation and transportation purposes.
1. Sanitary and water quality purposes.

Other uses of water such as hydropower where water is diverted, impounded or withdrawn are covered by statutes (Water Use Act) and associated regulations (AS 46.15 and 11 AAC 93.010 - .970).

IV. ACTIVITY SUMMARY

Forty-four rivers, streams, and lakes have been identified within the Tanana Valley State Forest as having significant fish, wildlife, recreation, or water values that will be protected within a Special Management Zone (Table 4). Activities and uses adjacent to or across unlisted waterbodies will be subject to interagency review and appropriate guidelines in the Forest Land Use Plan or the applicable permit review process.

Table 4. Waterbodies with designated special management zones. The special management zones include the side channels, sloughs, and backwaters of the following waterbodies.

**NOTE: The Stream Classification Committee is reviewing the standards for riparian management in interior Alaska. This section may need to be updated when this process is complete.

Waterbody	Unit(s)
Baker Creek	1
Hutlinana River	1
Lake 303: T2N, R11W, FM	1
Pothole Lakes: T3N, R4W, FM	1
Tolovana River	1,2,3
Iksgiza Lake	2
Kantishna River	2
Oblique Lake	2
Tanana River	2,5,7,8,10,12,13
Tatalina River	3
Goldstream Creek	4,5
Washington Creek	4
Anaconda Creek	6
Chena River	6
Little Chena River	6
Salcha River	7
Redmond Creek	7
McCoy Creek	7
Caribou Creek	8
Shaw Creek	8,9
Keystone Creek	8
Rosa Creek	8
Lake 992	9
Liscum Slough	9
Rapid Creek	9
Black Creek	10
George Creek	10,11
Goodpaster River, South Fork	10
Twelvemile Lake	10
Volkmar River	10,11
Healy River	11
Sand Creek	11,12
Bear Creek	12
Billy Creek & associated lakes	12
Fish Lake	12
Mansfield Creek & assoc. lakes	12
Mansfield Lake	12
Robertson River	12
Round Lake	12
T Lake	12
Porcupine Creek	12
Clearwater Creek	13
Little Tok River	14
Tok River	14

SCIENTIFIC RESOURCES

I. GOALS

A. Research Natural Areas
Maintain ecologically representative or unique sites in a natural state for observational research, education, and environmental monitoring.

B. Experimental Forests
Provide forest land for forest research that involves site manipulation or long-term observation.

C. Reserves
Reserve timber stands with unique or unusual characteristics, or those necessary for long-term scientific research, from timber harvest. There are no reserves within the TVSF now.

D. Other Scientific Values
Provide opportunities for scientific investigation and education within the Tanana Valley State Forest that will help increase knowledge of the environment and the impact of various land use activities.

II. MANAGEMENT GUIDELINES

A. Research Natural Areas
Research Natural Areas (RNAs) are intended to provide sites within which baseline ecological research and education can be conducted. It is intended that these areas be maintained in their natural state as much as possible.

1. Incompatible Activities and Uses
The first list of activities requires an authorization to occur, so can be prohibited by simply not issuing a permit for the activity. The second list of activities are those that are not now restricted, that do not require a permit, and are therefore much harder for the Division of Forestry to monitor and control. Those uses would only be regulated if a problem developed with a specific activity. In addition, the second list is not a complete list; it is only a list of examples of activities that could cause problems.

The following activities will typically not be authorized unless they are found to be consistent with the management intent for the area. Authorizations will be conditioned to protect research natural areas from incompatible activities.

Incompatible activities that require authorizations

1. Timber harvest
2. Material extraction
3. Developed recreation
4. Improved pasture or unimproved grazing

5. Trapping cabins
6. Introduction of species not endemic to the area
7. Commercial collection of bark, roots, and other plant materials.

Currently, DOF does not expect incidental individual activities to impair research natural areas. However, if Generally Allowed Uses (11 AAC 96) threaten the integrity of a research natural area, DNR may establish a Special Use Land designation (under 11 AAC 96.010) in the future to regulate individuals' activities within RNAs. The Special Use Land designation is consistent with the TVSF Management Plan, and may be established without an amendment to this plan. Examples of activities that may be regulated include:

Examples of activities that may become incompatible

1. Use of all motorized ground vehicles, such as snowmachines, tracked vehicles, four-wheel drive vehicles, pickup trucks, automobiles, and motorcycles off established rights-of-way.
2. Campfires and warming fires.
3. Gathering of dead and down wood, and collection of other plant materials.
4. Camping on vegetated sites.
5. Digging or excavating.
6. Disturbance or removal of vegetation including brushing survey lines or trails, cutting or removing vegetation.
7. Driving livestock.
8. Placing of markers or stakes.

1. Access through Research Natural Areas

A research natural area shall not block access to or use of other resources. When access through a research natural area is necessary (if there is no other feasible and prudent access route to resources beyond the RNA), roads will be designed and located to protect the features for which the RNA was designated, as much as possible. Roads will be designed in consultation with researchers or research agencies with a known interest in the RNA.

If research is being done in the RNA, and if the researcher has notified DOF of the nature and location of their research, the researcher must be consulted before any authorizations are issued to avoid impacts to research. Access through the research natural area will be designed to avoid impacts to the research site whenever possible.

The entity building the road will be required to sign the entry and exit points from the RNA.

3. Posting of Incompatible Activities

Signs will be posted at likely entry points to research natural areas. The signs will list activities that are regulated or are incompatible with the RNA.

4. Mineral Exploration

Mineral exploration will be conducted in research natural areas so that scientific values are minimally disrupted. Surface geophysical or geochemical surveys must show positive

results before heavy equipment is permitted to operate within prospecting sites or mineral claims. Results of such surveys will be made available to the general public.

5. Fire Management
The Division of Forestry will consult with appropriate research agencies in planning fire suppression activities, except for initial attack, within research natural areas. For additional information on fire management topics in this plan, see the Interagency Fire Management Plan section in Chapter 1, the Fire Management part of the Timber Management section of Chapter 2, and the Fire Disturbance section of Chapter 4.

6. Hunting and Trapping
Research natural areas are open to fishing, hunting and trapping. Hunting and trapping of certain animal species of scientific interest may be restricted temporarily during periods of study. Should a research project for the RNA be conceived that requires temporary restrictions or changes to hunting, trapping, fishing, or ADF&G management activities during the period of the study, DNR shall cooperate with the appropriate division(s) of ADF&G to evaluate the proposed restriction and if necessary take measures up to and including interaction with the State Board of Game or Board of Fisheries to enact necessary restrictions.

B. Experimental Forests

1. Bonanza Creek Experimental Forest
The USDA Forest Service, Pacific Northwest Research Station, has management authority for the Bonanza Creek Experimental Forest (Subunit 5B). As outlined in the lease granted to the Forest Service by the Department of Natural Resources (Appendix D), the Forest Service must approve all activities in the Experimental Forest, including timber harvest, road construction, and mineral exploration and development.

2. Research and demonstration forest under University direction
Legislation to address the University of Alaska land entitlement might direct establishment of a research and demonstration forest under University of Alaska ownership and management within the boundaries of the TVSF. Implementation of legislation to establish such a forest will not require an amendment to the TVSFMP management plan.

C. Reserves

Note: There are no reserves within the TVSF now.

1. Areas reserved from harvest will be withdrawn from the timber base upon which the allowable cut is determined.
2. When reserved stands succumb to mortality, or lose the value for which they have been reserved, they may be harvested or salvaged.
3. Reduction factors will not be used to establish or justify the establishment of reserves.

D. Other Research Activities

Researchers are encouraged to notify the Division of Forestry of the location of their research area, and the type of research being done. A permit is not required for research that

only involves Generally Allowed Uses. However, if DOF has been notified, the research site can be protected from disturbance by development activities.

A number of pipeline right-of-way leases and applications run through and adjacent to Research Natural Areas. Management of Research Natural Areas is subject to valid existing rights.

III. ACTIVITY SUMMARY

A. Research Natural Areas

Six research natural areas that total 11,141 acres have been set aside in their natural state for scientific and educational purposes (Table 5).

Some RNAs included significant portions of commercial timber, even though they were not created to protect this vegetation type. The boundaries of three RNAs near Delta Junction have been redrawn to minimize the commercial timber land inside the Research Natural Areas while protecting the features for which the RNA was created. In one case (Subunit 8B, Rosa-Keystone Dunes), the RNA was expanded southward to include more land containing dune features. For Subunit 10B (Volkmar Bluffs RNA), while a large portion of the RNA was cut out to allow for timber harvest of the commercially valuable forest lands and to allow access to the uplands, DNR is also proposing an amendment to the Tanana Basin Area Plan that will expand the research natural area to encompass another complete prairie feature. In Subunit 9B (the Shaw Creek Tamarack RNA), a small portion was cut out to remove most of the valuable commercial timber land from the RNA. (See also Unit 2 for issues regarding the Oblique Lake RNA.)

Table 5. Designated Research Natural Areas.

Research Natural Area	Subunit	Acres
Oblique (Tschute) Lake	2B	2,990
Caribou Crossing	2C	1,251
Rosa-Keystone	8B	2,337
Shaw Creek Tamarack	9B	1,887
Volkmar Bluffs	10B	1,638
Johnson Slough Bluffs	10D	1,038
Total		11,141

B. Bonanza Creek Experimental Forest

The USDA Forest Service Institute of Northern Forestry (now known as the Boreal Ecology Cooperative Research Unit) has leased 13,852 acres for use as an experimental forest for manipulative and observational forest research. Although management authority for the Bonanza Creek Experimental Forest rests with the Forest Service, resources within the forest remain the property of the state.

C. Other Research Activities

Other research activities in the Tanana Valley State Forest include permanent sample plots and selected yield plots established by the University of Alaska at Fairbanks and the U.S. Forest Service.

SUBSURFACE RESOURCES

I. GOALS

A. Mineral and Energy Supplies

Make metallic and nonmetallic minerals, coal, oil and gas, materials, and geothermal resources available to contribute to the energy and mineral supplies and independence of the United States and Alaska.

B. Economic Development

Contribute to Alaska's economy by making subsurface resources available for development, which will provide stable job opportunities and stimulate growth of secondary and other primary industries.

C. State Revenues

Establish a stable source of state revenues.

D. Environmental Quality and Cultural Values

When developing subsurface resources, protect the integrity of the environment and affected cultures to the extent feasible and prudent.

E. State Support for Mining

Aid in the development of infrastructure (for example, ports, roads, or railroads) and continue to provide technical support to the mining industry.

Note: For goals on salvaging timber prior to development activities, see the Timber Management section, Management Guideline G. Salvage of Timber from Land Clearing.

II. MINERAL AND COAL DEVELOPMENT GUIDELINES

A. Coal Exploration

State land in the Tanana Valley State Forest may be leased or opened for coal prospecting permits if DNR determines it is in the best interest of the state as required by AS 38.05.035. Before a permit is issued, DNR will determine if the surface values are significant enough to warrant restricting surface entry. Decisions on surface entry for coal adjacent to streams will be made in consultation with the affected agencies.

B. Open to Mineral Entry

All lands that are open to mineral entry are multiple use areas where mineral development will be accommodated and encouraged. Recognized exploration methods for locatable minerals will be allowed on all state lands unless specifically closed to mining or designated as special use land and will be subject to the conditions of a land use permit. DNR may determine that some traditional forms of access will not be allowed in specific areas to avoid resource damage.

Where an area is open to mineral entry, a miner has the right to stake a claim regardless of the surface use designation or classification. Any adverse effects of mining on surface resources or uses will be managed through compliance with state laws and regulations and the management intent and guidelines of this plan.

C. Reclamation of Mined Land

Land use permits and plans of operation for mineral development and gravel extraction will specify measures needed to return the land to a useful state. Determination of the specific measures to be taken and whether or not a performance bond will be required will be done in consultation with the affected agencies. Specific measures may include storage and reuse of topsoil; disposal of overburden; regrading of tailings and revegetation; re-establishment of natural (not necessarily original) contours; re-establishment of natural drainage systems; long-term erosion control measures; and removal of equipment, improvements, and other man-made items.

D. Access for Mineral and Coal Development

Existing roads and trails should be used to provide access to mine sites wherever feasible. Regulations for miscellaneous land use permits require that access be managed so that damage is minimal.

Access across tundra, wetlands, and other environmentally sensitive areas will be managed to minimize damage (see the Transportation section of this chapter).

E. Unauthorized Use of State Lands

DNR will place a high priority on taking appropriate action against construction of illegal structures that block public access or other unauthorized use of public lands for private purposes. This will include taking appropriate action against mining claimants who use their claims for facilities that are not necessary for prospecting, extraction, or basic mining activities. In carrying out this policy, emphasis will be placed on unauthorized uses that obstruct significant settlement, public recreation, or other public uses or obstruct public access.

F. Control of Visual Impacts

Guidelines will be developed as necessary through the land use permit or leasing process to minimize the adverse visual impacts of mining especially in settled areas, recreation areas, and in areas viewed from roads. In such areas, guidelines should minimally consider, the following items: control of solid wastes; removal of vegetation; siting of mining structures, tailings and overburden; roads; and rehabilitation of mining sites.

G. Approval of Plans of Operation

DNR may approve plans of operation required for locatable mineral leases if the plans adequately address the guidelines of this plan and DNR has consulted with and carefully considered the recommendations of ADF&G and DEC. Violation of the plan of operations is cause for enforced cessation of operations if, after a reasonable period of time, a negotiated solution cannot be reached with the operator or a violation is repeated.

III. GUIDELINES FOR THE APPLICATION OF LOCATABLE MINERAL CLOSURES

Locatable mineral closures are the most extreme management tool that can be used by DNR to resolve subsurface and other resource conflicts. AS 38.05.185(a) requires that before an area of state land can be closed to mining or mineral location, except as provided in AS 38.05.300, the commissioner must make a written finding that mining would be incompatible with significant surface uses. The area to be closed to mineral entry and location will be limited to the minimum necessary to protect the continued productivity and availability of the surface resources being protected.

IV. GUIDELINES FOR THE APPLICATION OF THE LOCATABLE MINERAL LEASING PROGRAM

State land may not be closed to mining or mineral location unless the commissioner makes a finding that mining would be incompatible with significant surface uses. The acquisition of rights to locatable minerals may be restricted to the leasehold location system where the commissioner determines that mining would present potential conflicts with significant surface uses. Mineral leasing is preferred over mineral closure as a management option to resolve conflicts between mineral development and other significant surface uses.

Prior to restricting the acquisition of rights to locatable minerals to the leasehold location system, DNR is required to identify potential conflicts between mineral development and other significant surface uses that need protection and issue a Finding of Incompatibility. DNR will consult with ADF&G and DEC in the development of any leasehold location order stipulations needed to protect those other resources.

V. RESOURCE VALUES THAT MAY CONFLICT WITH COAL OR MINERAL DEVELOPMENT

The decision to apply mineral closures or locatable mineral leasing will be made by the commissioner within the parameters set by the Alaska Statutes. AS 38.05.185(a) requires that the commissioner determine that mining is incompatible with a significant surface use before an area can be closed to mining. The same section of statutes requires the commissioner to determine that a potential use conflict exists before requiring the development of locatable minerals under a lease (see Chapter 4, Finding of Incompatibility).

In some circumstances, the commissioner may find that the following categories of resource values require locatable mineral leasing or closure, or prohibit coal leasing and prospecting to protect their continued productivity and availability. In other circumstances, care during mineral development is all that may be necessary to protect these resources. The degree of conflict that could occur between mining and any other resource value is impossible to predict in all circumstances. Therefore, the following categories or resource values will be evaluated to determine if locatable mineral closure, locatable mineral leasing, prohibition of coal leasing or prospecting, special land use designation, or another management option is needed to protect the continued productivity and availability of the resource in conflict.

A. Lands With Significant Commercial, Industrial, or Public Use Values

- Lands with significant coal, oil and gas, timber, or other commercial potential.

- Lands recognized as future transportation corridors where access for pipelines, road, railroads, utility corridors, or other surface transportation infrastructure could be blocked or impeded by mining claims. (After the alignment is established, areas will be reopened if there is surplus land.)

- Lands and waters that provide unique or unusual opportunities for the human use and enjoyment of fish or wildlife, including fishing, hunting, trapping, photography, and viewing.

- Lands and waters that provide significant recreation opportunities, such as clear water rivers that are now or are expected to be important for recreation, key public access sites, and recreation facilities.

- Lands and waters with significant scientific or educational value.

- Lands and waters that are the watershed of a community water supply.

- Sand and gravel pits, stone quarries, or other significant known material sites that might be lost to public use if mineral claims were staked.

B. Lands with Significant Fish or Wildlife Resources

- Lands and waters that support protected species of plants, fish or wildlife (such as bald or golden eagles), threatened and endangered species.

- Lands and waters that support production or maintenance of fish or wildlife species that have significant economic, subsistence, recreational, scientific, educational, or cultural values or that have been given special protection through state or federal legislation or international treaty.

- Other lands and waters not included above that are known to support unique or unusually large assemblages of fish or wildlife.

VI. OIL AND GAS GUIDELINES

Generally, oil and gas exploration, development, and production will be encouraged on state lands. Impacts on other important uses and resources will be managed through appropriate mitigation measures such as those contained in this plan and those developed during the permitting and leasing processes.

Oil and gas guidelines are not addressed here. Oil and gas guidelines specific to a particular management unit are in Chapter 3. DNR's statewide policies for oil and gas are found in the Five Year Oil and Gas Leasing Program. Specific stipulations for oil and gas exploration,

development, and production activities will be developed and applied on a case-by-case basis for each oil and gas lease sale that uses the lease sale process.

VII. MATERIALS GUIDELINES

A. Preferred Material Sites

When responding to a request for a material sale or identifying a source for materials, the highest priority should be given to using existing upland material sources. Using materials from wetlands, lakes, and the active[1] or inactive[2] floodplain of rivers or streams should be avoided unless no feasible alternative exists. Sales or permits for gravel extraction will not be permitted in fish spawning beds. Material extraction from water sources may also be regulated by the Corps of Engineers.

B. Material Sites

To minimize the construction and maintenance costs of transportation facilities, material sites should be located as near to the site where the material is used as practicable.

C. Material Extraction from Sensitive Areas

Material extraction from wetlands, lakes, or stream corridors (including the active and inactive floodplain) should occur only after design consultation with ADF&G, DOT/PF, DPOR, DGGS, and DEC.

If the only feasible and prudent source of gravel is an active or inactive floodplain of a stream or river, the following guidelines[3] will be used, in addition to the design consultation required above, to minimize negative impacts of material extraction on other resources and uses.

1. Stream types should be selected for material extraction based on the following order of preference (most to least preferable): braided, split, meandering, sinuous, and straight. This order of preference reflects the availability of gravel from exposed bars. The largest volumes are available from braided systems and the least from straight systems. An additional factor is the decreasing floodplain width of the stream types identified above. Wider floodplains allow extraction further from the river channel itself, reducing environmental impacts.

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[1] Active floodplain - the portion of the floodplain that is flooded frequently; it contains flowing channels, high-water channels, adjacent bars, and usually little or no vegetation.

[2] Inactive floodplain - the portion of the floodplain that is flooded infrequently; it may contain high water and abandoned channels and is usually lightly to heavily vegetated.

[3] These guidelines are adopted from "Gravel Removal Studies in Arctic and Subarctic Floodplains in Alaska", USFWS, Biological Services Program, June 1980. More detailed guidelines are continued in the "Guidelines manual" that accompanies that report.

2. Generally the largest river feasible should be selected for a gravel operation in a given area. Larger rivers have higher volumes of gravel and wider floodplain. The proportionally smaller disturbance in large river systems will reduce the overall effect of gravel removal.

3. Mining gravel from active channels should be avoided to reduce detrimental effects on water quality, aquatic habitat and biota. However, if hydraulic changes can be minimized, in-channel sites will replenish more rapidly than other areas and effects on the terrestrial biota and scenic quality of the floodplain will be avoided or greatly minimized.

   Before gravel is extracted from the active floodplain or channel of a stream or river DGGS should be consulted to ensure that the planned operation does not exceed the annual rate of gravel deposition and cause upstream erosion. It is particularly important for DGGS to establish the rate of deposition in rivers or streams when large quantities of gravel will be taken from the active floodplain or channel over long periods of time.

4. Whenever possible, avoid vegetated habitats.

5. When scraping gravel in active or inactive floodplains, maintain buffers that will contain active channels to their original locations and configurations.

6. When small quantities of gravel are required (up to approximately 50,000 yd^3), sites should be selected that have only unvegetated gravel deposits.

7. When large quantities of gravel are required (over 50,000 yd^3), select large rivers that contain sufficient gravel in unvegetated areas, or select terrace locations on the inactive side of the floodplain, and mine by pit excavation.

8. If pit excavation is used, design a configuration with high shoreline and water depth diversity and provide islands.

9. If mining in vegetated areas, save all overburden and vegetative slash and debris to use during site rehabilitation to facilitate vegetative recovery. This material should be piled or broadcast so that it will not be washed downstream.

C. Maintaining Other Uses and Resources When Siting and Operating Material Sites

Before allowing the extraction of materials, DNR will ensure that the requirements of the permit or lease give adequate protection to other important resources and uses including, but not limited to existing water rights; water resource quantity and quality; navigation; fish and wildlife habitat and harvest; timber resources; recreation resources and opportunities; historic and archaeological resources; adjacent land uses; and access to public or private lands. The disposal of materials should be consistent with the applicable management intent statement and management guidelines of this plan.

DNR should also determine if other existing material sites can be vacated and rehabilitated as a result of opening a new material site.

D. Screening and Rehabilitation
Material sites should be screened from roads, residential areas, recreational areas, and other areas of significant human use. Sufficient land should be allocated to the material site to allow for such screening. Rehabilitation of materials sites must meet the requirements of 11 AAC 97.250(a). Design and closure of material sites should consider potential for future recreational use, such as swimming.

For additional guidelines that affect material extraction see policies under the Mineral and Coal Development Guidelines in the Subsurface Resources section of this chapter.

VIII. ACTIVITY SUMMARY

More than 99 percent of the State Forest will remain open to locatable mineral location and leasing. The Chatanika River corridor (Subunit 4B), is closed to mineral entry, coal leasing, and material sales. Locatable mineral closures will be placed on campgrounds and other significant recreational development; the Trans Alaska Oil Pipeline right-of-way is closed to mineral location.

Mineral exploration and development in the 24,993 acres (1.4 percent of the State Forest) that comprise the Bonanza Creek Experimental Forest and the six designated research natural areas is subject to a leasehold location order. Mining will be restricted in these areas if it will negatively impact the overriding scientific values of the areas. In addition, mineral exploration is also restricted in the Bonanza Creek Experimental Forest under the provisions of 11 AAC 96.140 (10).

TIMBER MANAGEMENT

I. GOALS

A. Economic Development

Contribute to Alaska's economy with a diversified forest products industry that provides a range of job opportunities, net revenues to the state, competitively-priced products and increased per capita income, while ensuring that personal use needs of all Alaskans are met within the capabilities of the land. Emphasize support of Alaskan value-added businesses when designing and offering timber sales in the State Forest.

B. Management of the Tanana Valley State Forest Timber Resources

Actively manage the State Forest to provide for production, utilization, and replenishment of timber resources through silvicultural practices. Ensure a high level of sustained productivity of timber by maintaining a mosaic of forest types and stand ages characteristic of the boreal forest in Interior Alaska. This strategy will also sustain other renewable resources that depend on forest vegetation.

The diverse resources and uses in the TVSF reflect the history of natural and human disturbance in the forest and the context in which the state forest land base was selected. The configuration of the state forest reflects the statutory requirement that it be composed primarily of commercially valuable forest.

Thirty years of forest research by the Forest Sciences Department at UAF and the Boreal Ecology Cooperative Research Unit (formerly known as the Institute of Northern Forestry), US Forest Service, as well as Canadian research, provide a good basis for making resource management decisions. DNR will continue to incorporate new research into management strategies as information becomes available. Information on natural and human disturbance history and ecological processes is incomplete, and this plan is based on existing information. To support sustained production of multiple resources and forest uses, the best approach is to maintain the range of forest types and stand ages.

C. Forest protection

Consistent with AS 41.15.010 and AS 41.15.020, forest resources in the TVSF will be protected from destructive agents commensurate with the values needing protection. The intent for fire management in the TVSF is to identify additional areas where wildland fire can be allowed or prescribed fire can be used to reduce costs of fire suppression, reduce risk of damaging fires, and maintain natural diversity and productivity of forest stands. Fire suppression will continue to be a priority near residential areas, infrastructure developments, and other investments. Specific recommendations for changes in fire suppression levels will be developed through the fire management plan review process. Timber and other resource assets will be considered when determining fire protection levels. For additional information on fire management topics in this plan, see the Interagency Fire Management Plan section in Chapter 1, the Fire Management parts of the Scientific Resources and the Timber Management sections of Chapter 2, and the Fire Disturbance section of Chapter 4.

II. MANAGEMENT GUIDELINES

A. Sustained Yield and Allowable Cut

The following section explains sustained yield and allowable cut and how the concepts are applied within the Tanana Valley State Forest. The sustained yield of the forest is the amount of timber the forest grows each year in the areas that are commercially suitable for timber harvest. The allowable cut is the amount of timber that can be harvested sustainably from that same area while meeting management intent and guidelines in this plan.

The allowable cut is developed in three steps.

Step 1: Forest Inventory. To determine how much timber can be removed on a sustained yield basis, the forested area is defined. Next, a forest inventory is conducted to determine the species, distribution, quality, and quantity of the trees growing in the defined area. The inventory identifies the acreage and standing volume of timber in the defined area. The inventory also includes measurements of growth rate and mortality, both natural processes within the forest. The inventory procedure is a sampling process which includes sufficient on-the-ground measurements to establish an acceptable level of the reliability of the sampling.

Step 2: Sustained Yield. Next, the amount of timber that can be harvested periodically without exceeding growth is calculated. Areas that are not commercially viable are deleted from the timber base. In the TVSF, for example, black spruce forest types are deleted from the timber base. The initial rotation age is derived from culmination of mean annual increment. Using this assumption, the acreage that can be harvested sustainably is calculated. This estimates the sustained yield of timber that could be harvested. See the consultant's AAC report as a basis for the 2001 rotation age determination. See the Glossary, Appendix A, for definition of culmination of mean annual increment.

Step 3: Allowable Cut. The annual allowable cut modifies the sustained yield estimate to reflect the guidelines and objectives in the Tanana Valley State Forest Management Plan. Three factors affect the AAC.

- Site-specific factors. Not all of the State Forest is available for harvest. For example, the six research natural areas, the Chatanika River corridor, and the Bonanza Creek Experimental Forest are not included in the timber base.
- Unknown conditions. Reductions may be made from time to time as it is determined that an area should not or cannot be harvested. Because managers know such conditions exist, but not where they all occur, reduction factors (a percentage of each species) are also applied to make the calculation conservative. See the Activity Summary at the end of the Timber section for an explanation of the reduction factors. The reduction factor is a reduction to the allowable cut for unknown, on-the-ground situations where timber harvest may not be feasible or appropriate.
- Rotation age adjustments. Rotation age is adjusted to meet management objectives. These rotations are applied to that portion of the State Forest on which timber harvesting is allowed. Rotation may be based on many criteria, including mean size,

age, culmination of mean annual increment, attainment of a particular minimum physical or value growth rate, and biological condition. There may be different rotation ages for different species, growing sites, and other factors. Application of the adjusted rotation age to the sustained yield (both by species) results in an allowable cut for the forest. Generally, it is expressed as a ten-year periodic allowable cut to allow for fluctuations in harvest rates due to market conditions and other variable factors. This is the allowable cut. See the DNR Division of Forestry's Tanana Valley Allowable Cut Determination for more information.

NOTE: The annual allowable cut for the TVSF is incorporated in the DNR Division of Forestry's Tanana Valley Allowable Cut Determination. This report covers the allowable cut for the TVSF and state lands in the TBAP that are available for timber management.

B. Sustained Yield of Timber and Allowable Cut

The sustained yield levels of timber will be established for each of the four management areas of the State Forest. In order to achieve consistent and coordinated management of timber harvest on a landscape level within each management area, the sustained yield on nearby state land will be consolidated with that of the TVSF. Sustained yield levels will be based on current forest inventory data. Sustained yield will be calculated to achieve a high level of periodic output as defined by AS 41.17.950 and to maintain long-term productivity of the land. Since sustained yield is based on variable factors such as forest age, site productivity, reforestation, fire occurrence, and harvest levels, the sustained yield should be recalculated on an ongoing basis as new data are acquired. Sustained yield levels will be established using commonly accepted methods or formulas such as area control, volume control, or optimization programming appropriate to the nature of the data, character of the forest, and anticipated level of management.

Timber harvest will be controlled within the allowable cut based upon the sustained yield of timber available for harvest consistent with guidelines and designations of this plan. Within any 10-year period, the amount of timber harvested will not exceed 10 times the annual allowable cut. Harvests may exceed the allowable cut only in unusual circumstances as described by the Alaska Superior Court (First Judicial District) in their decision *SEACC vs. Alaska, 1983.* In particular, departures are allowed for salvage cuts where trees have been killed or damaged, because dead trees are not part of sustained yield. Proposals for salvage sales will be subject to public and interagency review through the FLUP process. DOF will also include salvage sales on Five-Year Schedules whenever possible. Salvage sales may be excluded from a Five-Year Schedule under AS 38.05.117 when waiting for the Schedule will cause substantial losses of economic value on salvage sales.

C. Procedure for Modifications to the Allowable Cut

The Allowable Cut (AC) may need to be recalculated due to a variety of issues external to the current planning process. The AC report is not a decision document, but a technical calculation based on information from the management plan, sustained yield report, and inventory report. Revisions of the AC could affect forest management

activities and the public should receive notice of AC revisions. Two general categories of AC modifications are anticipated by the DOF, local and forest-wide.

Boundary changes in the state forest, land withdrawals, large fires or other landscape level disturbances that affect the data that the AC is based upon are examples of local events that would require a review of the AC document. Such changes would add or delete acreage of various forest types from the forest and result in a technical change to the AC. Such modifications would likely within specific units in the forest and not be forest-wide revisions.

Technical changes to the AC, based on changes to the timber base, will be explained in the Five Year Schedule of Timber Sales (FYSTS) by the administrative unit of the forest in which the proposed change originates. There are currently four administrative units: Fairbanks, Kantishna, Tok and Delta. Each year a FYSTS is prepared for each of these areas; the Fairbanks and Kantishna areas are covered in a single document. Schedules are reviewed by: the Alaska Department of Fish and Game, Department of Environmental Conservation, the TVSF Citizen's Advisory Committee and the general public.

Examples of changes that would merit a forest-wide revision of the AC, based on changes to the assumptions, include changes in utilization standards, updated forest inventory data, revised site index data, or new yield tables for commercial species. Forest-wide revisions will be noticed in the FYSTS and will be subject to a technical review of the suggested changes. This could include peer review of the revised sustained yield report, inventory report or other related documents. A final report would be made to the TVSF Citizen's Advisory Committee and to the Board of Forestry for their review prior to adopting the revisions. An opportunity for public comment will be provided.

D. Availability of Timber for Harvest

Any area in the State Forest is available for timber harvest and is part of the timber base for calculating the allowable cut unless it is prohibited by law or by this plan through a finding of incompatibility (see Appendix B, Finding of Incompatibility). When planning timber sales, the Division shall weigh the pros and cons of dispersing the locations of sales versus concentrating them, with consideration for public needs, forest management objectives, and other factors.

E. Management of Commercial Forest Types

Management of the region's forest resources has occurred in varying degrees since the 1960's, but the creation of the State Forest in 1983 ushered in a new era of forest management for Interior Alaska. A region-wide forest inventory was initiated in 1983 and the first forest management plan was completed in 1988. For the first time, foresters had a comprehensive plan and accurate inventory data to assist them with management of the forest.

Since the 1960s, the commercial timber sale program has grown slowly. However, timber harvest in the Tanana Valley State Forest currently averages less than 1,000 acres

per year, which is less than 6 percent of the allowable cut. This figure has varied on an annual basis from a few hundred acres to over a thousand acres in some years due to market demand for white spruce sawtimber. At current harvest rates, most of the trees alive today will die from natural causes long before they can be harvested.

Many management units in the forest have no road access and will continue to have no road access for the foreseeable future. The distribution of stands across the forest, reduction factors and research natural areas will ensure that older age classes of white spruce will be maintained in the forest. Federal and state conservation areas within the Tanana Valley will also provide opportunities for older age classes to persist. However, DNR authority only extends to state lands. As market demand and access conditions change in the decades ahead, the Division may need to adopt additional policies concerning age class diversity. Under current harvest levels, the amount of old growth will continue to increase in the absence of fire.

1. Upland Forests

Upland forests include birch and aspen forests, mixed hardwood-white spruce, and white spruce forests on relatively well-drained, warm sites. Under natural conditions fire is common. Fire cycles are estimated to be 100-150 years. Fires occur in a wide range of sizes, often creating openings of hundreds to many thousands of acres. A variety of other disturbances can also occur that can create large or small stand openings. These can include storm events, such as stem breakage and windthrow, and insect outbreaks. Tree diseases are also important disturbance agents, with root rots and stem decays being the principal cause of canopy-opening events attributable to pathogenic factors. Hardwood stands are usually the first forest cover type to develop following fire, with spruce developing more slowly until mixed stands occur. Stands dominated by white spruce are the oldest and least common upland forest type, generally growing only where no severe natural disturbance has occurred for 100 years or more.

For the last several decades, wildland fire has been actively suppressed in the TVSF, which has helped decrease the natural disturbance level in upland areas. The high level of human-caused disturbance in the early 1900s and fire suppression since the 1950s has resulted in a distribution of age classes that is heavy in the 60 to 120 years category with fewer younger stands. (Data on stand ages is from "Timber Resources on State Forestry Lands in the Tanana Valley", Crimp, P.M., S.J.Phillips, and G.T.Worum, DNR, 1997.) It is important to maintain younger stands for wildlife habitat benefits and to provide a recruitment pool for the poletimber and sawtimber age classes. (See Glossary for recruitment and age class definitions.). Older forests are probably more susceptible to severe wildland fire and to insect and disease damage. More species and age diversity will result from the careful application of fire management techniques and harvest activities. In areas where timber harvest is not likely to maintain a mix of stand types and ages, wildland fires will be allowed to burn. DNR will design management activities to maintain a mix of native forest types (including aspen, birch, mixed hardwood-spruce, and white spruce types) and stand ages. The effects of harvesting and fire are not identical. However, harvests will be located and designed to provide some of the key benefits of natural disturbances, particularly fire. These benefits may include warmer

soils, increased sunlight, a mosaic of vegetation patterns, fuel reduction, and some wood left on site, such as snags, logs, and diseased trees. Specific sales will be designed to achieve site-by-site objectives. Examples of practices include:

- Clumping sales to produce larger aggregate openings over time with patches of residual trees.
- Using irregular shapes; following stand type boundaries in sale layout.
- Removing or killing all species in harvested areas (e.g., white spruce and hardwoods rather than just white spruce).
- Designing harvests to increase disturbance and early successional forests. However, in certain areas, salvage harvests will continue to be allowed to achieve other objectives, such as reforestation in high-demand areas, or to limit the spread of major infestations.
- Tailoring reforestation techniques to ensure seedbed availability and adequate regeneration of a range of native upland forest types.
- Where feasible, allowing wildland fire in areas where harvest is unlikely to maintain a mix of stand types and ages.
- Using prescribed fire where feasible for site preparation, habitat management, and fuels management.
- Experimenting with a variety of silvicultural systems to reflect non-fire disturbances and documenting the results.

2. Floodplain Forests

Floodplain forests include balsam poplar, mixed balsam poplar and white spruce, and white spruce stands. Mixed birch and spruce stands also occur, especially on older floodplain sites. Occasionally, pure stands of white birch occur on floodplain sites. These floodplains can be active or inactive and can best be described as "flat land bordering a stream or river." (See glossary for a complete definition.) The floodplain is a complex continuum of landforms called floodplain terraces. These terraces represent different time periods in the development of the landform and are created through accretion and erosion events. Frequently, only a one- or two-foot difference in elevation will separate terraces of different ages. Subsequently, these terraces exhibit different vegetation types both in species composition and age.

Floodplain sites are subject to a variety of natural disturbances: erosion, flooding, and ice damage near active river channels; fire; insects and disease; windthrow; and thermokarsting. From about 1900 to 1940, extensive harvesting occurred in floodplain sites, especially along the lower Tanana River. Mining also disturbed floodplain forests. These disturbances were typically smaller-scale than the large upland fires, and they created a complex mosaic of stand types and ages. Hardwoods are usually the first forest cover to develop, followed by mixed hardwood-spruce stands, and finally white spruce. As in the uplands, stands composed primarily of white spruce are frequently the oldest commercial forest type. These stands develop over a longer period of time in the absence of stand replacement disturbance. Overall, stand-replacement disturbance is less frequent in floodplains than uplands, as evidenced by the presence of older stands with a greater range of stand ages, including stands greater than 180 years old. Because fire is only one

of several stand replacement disturbances in the floodplain, fire's role is less important in the overall disturbance of floodplain forests than upland forests.

DNR will manage floodplain forests to maintain a mosaic of floodplain forest types (balsam poplar, mixed spruce-poplar and spruce-birch, and white spruce stands), and a range of stand ages, including some older stands to maintain structural diversity. Examples of silvicultural practices in floodplain forests include:

- Using a variety of harvest systems with variable levels of canopy removal to simulate diverse natural disturbances.
- Dispersing harvest openings.
- Using irregular and/or meandering borders for harvest units.
- Maintaining a mixture of white spruce and hardwoods when reforesting harvest sites. Hardwoods usually reproduce aggressively by natural means, such as sprouting or seeding. White spruce will frequently be planted.
- On cold soils in areas susceptible to fire under natural conditions, such as sites adjacent to upland areas or black and white spruce forest types, using mechanical site preparation or prescribed fire to warm soils on harvested floodplain sites.
- Not planting naturally-eroding harvest sites, but providing seedbeds and seed sources and monitoring for adequate reforestation.
- Considering harvest of actively eroding sites. Consistent with riparian management guidelines developed under the Forest Resources Practices Act for Region III, consider harvest of actively eroding sites.
- Where feasible, allowing wildland fire in areas where harvest is unlikely to maintain a mix of stand types and ages.

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F. Priorities for Timber Sales

DNR will give highest priority to preparing timber sales that are needed to maintain the range of forest types and stand ages that support diverse forest uses. Sales in upland areas where natural disturbance is restricted due to fire suppression are a high priority. In scheduling sales, DNR will also consider sales that are needed to support regional value-added processing.

G. Economic Objectives

In most cases, the economic value of timber sales in the State Forest will be sufficient to pay for the costs of timber sale preparation and administration, reforestation, and road construction and maintenance and result in net revenue to the state. However, some sales may be deficit sales if they involve low-value timber or are designed to achieve other public goals such as maintaining biological diversity, reducing risks from wildland fire near residential areas, accelerating reforestation following infestations, providing capital improvements, or providing fuelwood to local markets.

In weak markets, total sale costs including reforestation are more likely to exceed revenue than in strong markets. However, even in weak markets, sales continue to meet the state's primary economic objective for timber, which is to provide local jobs. To

further this mission, some sales are supported by CIP appropriations from the Legislature. Also, some sales laid out during times of weak markets are sold later as the market strengthens, so revenues may occur in a different year than costs.

H. Salvage of Timber From Land Clearing
Timber with commercial or personal use values should be salvaged from lands that are to be cleared for other uses such as mining, transportation or utility corridors, and habitat enhancement projects, where feasible and prudent. See Chapter 1 for statutory direction for the Tanana Valley State Forest.

I. Size of Timber Sales
Timber sales will be offered in a range of sizes and durations to accommodate various sectors of the regional industry and the public, and to meet the management objectives of the sale. Determination of sale volume and duration will also consider budget constraints, timber stand conditions, appraised value, and effects on other resources. Though allowable cut levels are set for 10-year periods, the Division will, to the extent feasible, minimize yearly fluctuation in timber quantities offered within a management area to maintain a stable supply of timber.

J. Five Year Schedule of Timber Sales
Locations of timber sales, acreage harvested, and quantities of timber offered will be proposed and reviewed in the Five Year Schedule of Timber Sales planning process, as determined by AS 38.05.113. Transportation and reforestation issues will also be addressed in the Five Year Schedule of Timber Sales. Other development proposals not related to timber harvesting may be included in the Five Year Schedule of Timber Sales. DNR may attempt to quickly salvage accessible timber following wildland fires or insect infestation. Salvage sales not included in the Five Year Schedule may be reviewed by other agencies and the public in Forest Land Use Plans.

K. Timber Sale Coordination
DNR will attempt to coordinate its timber sale offerings with the timber sales offerings of other landowners or agencies when it will increase the viability of offerings, or offer other public benefits. The public and agency review of the Five Year Schedule of Timber Sales offers the best opportunity to coordinate timber sales.

L. Forest Resources and Practices Act
The policies in this plan are in addition to those established in the Forest Resources and Practices Act (FRPA) (AS 41.17). The Forest Resources and Practices Regulations (11 AAC 95) also contain the guidelines that shall be followed in managing timber and other resources.

M. Silviculture and Harvest Practices
A variety of silvicultural systems will be utilized to achieve management objectives for specific stands of timber and will be discussed in the Forest Land Use Plan developed for each timber sale. (See Glossary for more detailed definition). These systems are a planned program of silvicultural treatments conducted over the life of the stand. Complexity will vary, but each

treatment begins with a reproduction cutting and progresses through intermediate treatments to another reproduction cutting at the end of the rotation.

An important aspect of the practice of silviculture is the recognition that it is conducted in the absence of complete knowledge concerning the changing economic and ecological factors that affect each stand. Many treatments can only be properly evaluated after many years have passed.

Silvicultural systems used will:

1. be consistent with the silvics of the species and ecology of the forest type;
2. maintain the site's productivity; and
3. be chosen to best achieve the management objectives. A variety of silvicultural systems, including uneven-aged management, may be used. The basic silvics of native commercial species are listed below.

Table 6. Characteristics of Interior Alaskan species.

Species	Shade Tolerance	Seed Crops	Seed Dispersal	Preferred Seedbed	Sprouting Ability
White Spruce	moderate	3-6 yr.	200 ft.	mineral soil rotten wood	none
Paper Birch	intolerant	1-2 yr.	400 ft.	mineral soil	stump sprouts (moderate if mature, low if overmature)
Aspen	intolerant	annual	long distance	mineral soil	high (root suckers)
Balsam Poplar	intolerant	annual	long distance	mineral soil	high (suckers and buried stems)

Harvest units will be sized and configured to best meet silvicultural, wildlife, scenic, and other objectives of the sale. See also the Scenic Values guideline of the Recreation section of Chapter 2, as well as AS 41.17.060(c)(6), 11AAC 95.820, and AS 38.04.200(a) and (b). Harvest methods can include intermediate partial cuts prior to the final stand renewal reproduction cuts as listed below. The harvest method used must meet the requirements (silvics) of the species to be established in the new stand. Harvest unit size and required harvesting techniques, including required or restricted equipment use, will be determined in the Forest Land Use Plan for each sale. The Forest Land Use Plan is subject to interagency and public review.

Table 7. Silvicultural methods used in different forest types.

Forest Type	Reforestation Target	Intermediate Cuts	Reproduction Cuts
White Spruce	Mixed white spruce and hardwoods	thinning sanitation improvement	clearcut seed tree group selection shelterwood
Birch	Birch	thinning sanitation	clearcut seed tree group selection
Aspen and Balsam Poplar	Aspen and balsam poplar	none	clearcut shelterwood (only to suppress reproduction)
Mixed	Mixed white spruce and hardwoods	hardwood removal sanitation	clearcut seed tree group selection shelterwood

N. Reforestation

The Forest Resources and Practices Act (FRPA) sets the standards for reforestation following logging, including the minimum stocking of residual trees allowed without reforestation. The priorities for reforestation are: 1. those required by the FRPA; and 2.

deforested or understocked highly productive sites. Sites will be reforested with native commercial species. When artificial reforestation is used, seed should be from the same seed zones designated in *Provisional Tree Seed Zones and Transfer Guidelines for Alaska*. Non-native species will be planted only for research purposes, not for forest management operations that would convert native forests to non-native species. The following table lists acceptable reforestation methods for major species.

Table 8. Probability of success by recommended reforestation method*

Species	**Artificial**		**Natural**	
	Planting	**Seeding**	**Seeding**	**Sprouting**
Spruce	High (Note 1)	Low (Note 2)	Medium (Note 3)	
Birch			High (Note 1)	Medium (Note 2)
Aspen and Balsam Poplar			Medium (Note 1)	High (Note 2)

NOTES*:

Spruce

1. Plant immediately following harvest or site preparation.
2. Spot seed on mineral soil seedbed; site preparation recommended.
3. Seed is only available every 3 to 5 years depending on cone crop; mineral soil seedbed and seed source within 200 feet is required.

Birch

1. Mineral soil seedbed required with seed trees within 300 feet.
2. Sprouting is unreliable for trees over 70 years.

Aspen and Balsam Poplar

1. Mineral soil seedbed needed.
2. All stems in clone should be cut; leave uncut 15+ native stems/acre if it is desired to minimize sprouting.

O. Fire Management

Fire management practices, including suppression and prescribed burning, will be designed to implement the land management policies laid out in this management plan. These practices will be described in a fire management plan that is developed as part of the Alaska Interagency Fire Management planning process. (See also Chapter 4, Section F.5, Fire Disturbance, for recommendations on changing fire suppression levels in the TVSF.)

P. Pest Management

*Table 2-8 and the 'Notes' above were generated by the technical experts on the Planning Team's Timber Working Group as they worked on reforestation issues during six meetings from 12/2/94 to 4/24/96.

1. Detection. An annual insect and disease detection survey will be conducted by the USDA Forest Service in cooperation with the DNR Division of Forestry.

2. Control. The primary approach to pest control in intensively managed sites in the Tanana Valley State Forest will be prevention. Prevention will consist largely of silvicultural practices that enhance natural control of pests. Management action may not be necessary in some areas where natural disturbance from forest insects and diseases is acceptable.

Q. Application of Pesticides and Herbicides

To date, timber management intensity in interior Alaska has been low and application of chemicals for weed control and insect and disease suppression has not been performed operationally.

Operational use of pesticides and herbicides will not take place within the State Forest unless the following actions are taken:

1. Research is conducted to weigh feasibility and effects of application on forest growth and environment.

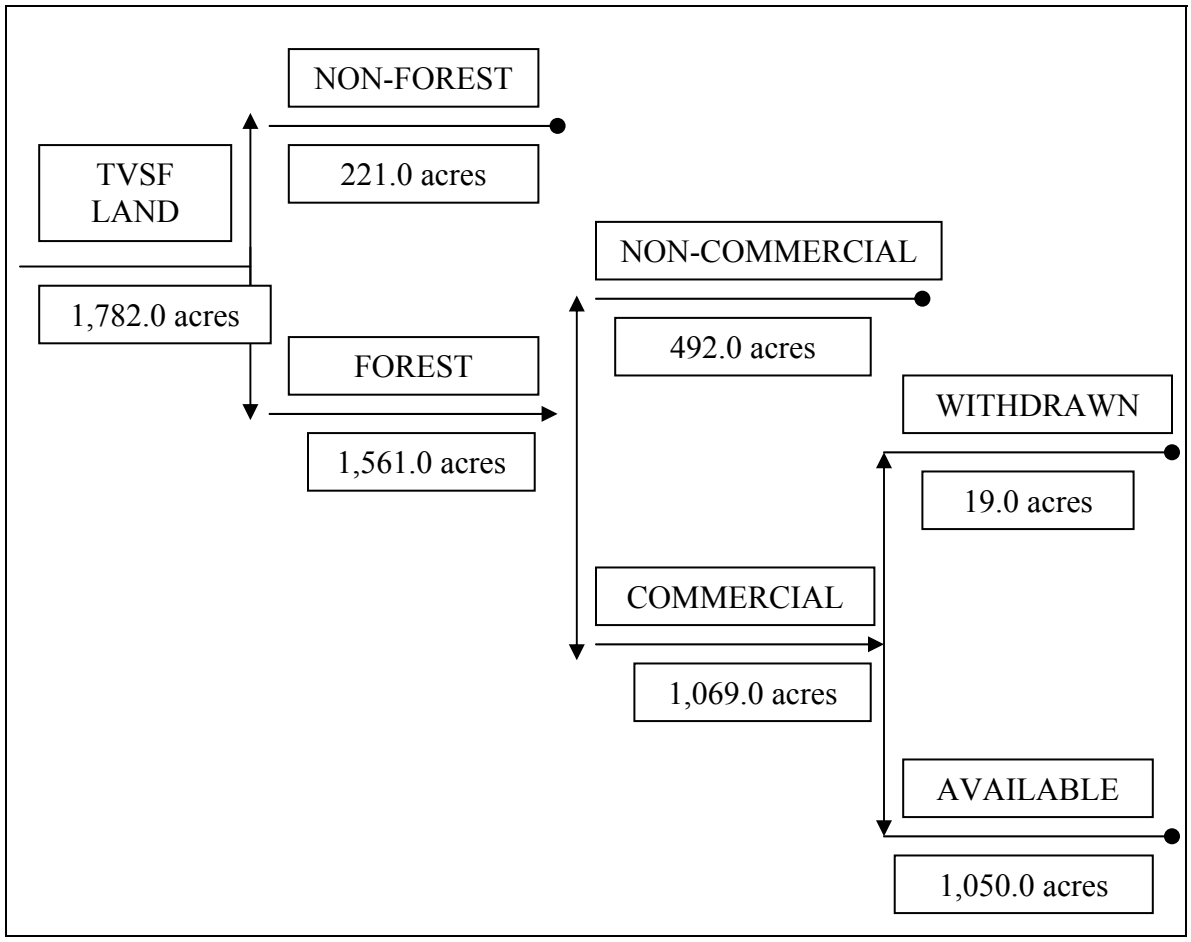
2. Public hearings are conducted.

3. DEC and ADFG are consulted and all applicable permits for the application of pesticides and herbicides have been obtained.

III. ACTIVITY SUMMARY

Approximately one million acres, or 56 percent of the forest, has been identified as commercial timberland containing approximately 1.2 billion board feet of timber. Near-term harvest volume will continue at current levels, which is less then 10 percent of the annual allowable cut. If market conditions or utilization standards change, sale volumes could increase. Sale locations will be annually identified in the Five Year Schedule of Timber Sales and a Forest Land Use Plan will be prepared for each individual sale.

Table 9. Acreage, in thousands of acres, of land by land classification in the Tanana Valley State Forest.



Certain forest land may be harvested selectively or not harvested at all because of overriding non-timber resource values or access limitations. Resources with overriding values may include fish and wildlife habitat and human use, recreation, tourism, private land, or cultural resources.

Reduction factors are a numerical reduction from the allowable cut to compensate for unknown, on-the-ground situations where timber harvest may not be feasible or appropriate. Reduction factors are also used to ensure that the allowable cut is not exceeded due to multiple use considerations, such as wetland setbacks, private land, cultural sites, eagle and falcon nesting sites, trails, wetlands, and special management zones. As these sites become known and

mapped, they will be removed from the timber base. Reduction factors are not allocated to any particular area through the planning process and do not designate specific sites for management for primarily non-timber purposes. Sites intended primarily for non-timber management, e.g., research natural areas, are identified in the individual units in Chapter 3, and in the Finding of Incompatibility, Appendix B.

Reduction factors have been established for each of five major forest vegetation types that may contribute to the sustained yield timber base. These factors represent the estimated percentage of timber volume that will not be available because of other values. They are based on the division's experience preparing timber sales. Reduction is highest for the vegetation types that are associated with rivers where more habitat and water quality concerns are highest. Reduction factors for black spruce and hardwoods are lower as they tend to occur in large expanses away from rivers or other site-specific resource concerns. The factors do not apply to research natural areas, the Bonanza Creek Experimental Forest, or the Chatanika River corridor, because these areas have been excluded in total from the sustained yield timber base.

Table 10. Reduction factors by vegetation type.

Vegetation Type	**Factor (%)**
Balsam poplar--white spruce	10
Hardwood	1
Hardwood - white spruce	5
White spruce	5
Black spruce	1

Note: Vegetation types are as defined in Crimp *et al.*'s *Timber resources on state forestry lands in the Tanana valley.*

TOURISM

Definition: Tourism markets Alaska's natural, cultural, historic, and recreational resources. The marketable resources on which tourism depends include scenic viewsheds, wilderness, forests, wildlife, lakes, and rivers, along with developed areas, which possess cultural, economic, and/or historical significance. The difference between recreation and tourism is that tourism is a commercial activity, while recreation is a leisure activity.

The Tanana Valley State Forest will be managed for multiple use, consistent with the purpose of the establishment of the State Forest (AS 41.17.200). The State Forest is one component of the mosaic of public land in the Tanana Valley that includes state and federal park land, as well as general state land that has been designated for recreation. The State Forest will be retained in state ownership and managed to allow a range of development activities to occur, including tourism operations.

Tourism activities in the State Forest are generally concentrated along rivers, roads, and trails. The tourism industry is an economic use of the Tanana Valley State Forest. The following list describes some of the resources in the Tanana Valley State Forest that benefit tourism.

A. The Tanana Valley's forests provide natural settings for visitors engaged in activities that range from sightseeing to canoeing to wilderness camping and hiking.
B. Timber harvest in the Tanana Valley State Forest creates timber roads that can provide access to the forest for people using all different modes of transportation, including dogsled, foot, horses, skis, ATVs, and snowmachines.
C. The Tanana Valley State Forest Management Plan allows for the development of roads, boat launches, pull-outs, campgrounds, cabins, and trails that would provide visitors with opportunities to access recreational and scenic sites. The plan also encourages the development of facilities that provide information about areas of cultural, economic, and/or historical significance, or about forest history and ecology (such as visitor centers and interpretive sites).

I. GOALS

A. Tourism Opportunities.

Opportunities to appreciate Alaska's natural environments, history and diverse cultures should be provided to enhance visitors' experiences in Alaska.

1. Continue to provide opportunities for a variety of different tourism activities (See Table 3, Recreation Opportunities Matrix, for examples of recreation and tourism activities in the State Forest).
2. Continue to allow long-term access to forest resources valuable to tourism.
3. Identify areas with tourism use. These areas are described in Chapter 3 on a unit-by-unit basis. Fishing and hunting are described in the fish and wildlife sections of Chapter 3.
4. Support appropriate commercial development of tourism facilities and services through leases and technical assistance where tourism needs can most effectively be provided by private enterprise, while avoiding or minimizing conflicts with other uses.

B. Tourism Resource Protection.
Alaska's natural, cultural and historic resources are the foundation of Alaska's tourism industry and they must be protected.

1. Protect natural features of regional or statewide significance and preserve cultural features representing major themes in Alaskan history.
2. Prevent soil erosion, loss of fish and wildlife habitat, degradation of scenic and recreation areas, and loss of access to open space.
3. Encourage public education through the use of signs, interpretive trails, and programs to portray natural, subsistence, cultural and historic features and forestry practices.

C. Economic Development.
Alaska is an international tourism attraction. The tourism industry has grown dramatically since statehood and is now one of the state's largest industries. Tourism creates jobs and services for Alaska residents, and many tourism dollars are spent in Alaska. The challenge is to provide the benefits of a tourism industry without conflicting with existing community lifestyles.
1. Manage Alaska's recreation resources to support a tourism industry that supplies jobs, income, and revenue. Minimize conflicts between tourism and other uses.
2. Allow for recreation and tourism facilities that enable appreciation of Alaska's scenic and historic resources.

II. MANAGEMENT GUIDELINES
A. Campgrounds, Public Use Cabins, and other Recreational Facilities.
These facilities are addressed in the Recreation section of this chapter.

B. Private Commercial or Public Nonprofit Recreation and Tourism Facilities.
Lodges, tent camps, ski areas, or other private facilities designed to be run as private, profit-making, or public nonprofit recreation and/or tourism facilities may be permitted or leased if the facility fulfills the following conditions:
1. The proposed development adds to or enhances public recreation and tourism opportunities.
2. The amount of use generated by the facility will not conflict with the management intent for the unit or site.

Tourism operations shall not preclude other uses of the State Forest, referenced in AS 38.05.112(c), unless a finding of incompatibility has been issued (see Appendix B).

The facility will be sited, designed, constructed, and operated to create the least conflict with natural values and traditional uses of the area. It will also be sited and designed in accordance with management guidelines for riparian and instream flow, fire management, access, and wetlands.

Final approval of a permit or lease for the facility will be given only after interagency and public review. This review may be coordinated with the review of the Five Year

Schedule of Timber Sales process. See Chapter 4 for a description of commercial use permit requirements.

C. Management of Forest Resources for Tourism.
Tourism is one of the uses for which the Tanana Valley State Forest will be managed. According to the Forest Resources and Practices Act, AS 41.17.060 (c)6, allowance shall be made for scenic quality in or adjacent to areas of substantial importance to the tourism and recreation industry. Techniques to address scenic concerns are discussed in Management Guideline M., Silviculture and Harvest Practices, part of the Timber Management section of Chapter 2. See also AS 41.17.060(c)(6) and 11AAC 95.820. The Protection of Scenic Resources part (Management Guideline H) of the Transportation section of Chapter 2 contains measures to help protect scenic resources, as well as guidelines that provide opportunities for road-accessible recreation activities. Also, the Scenic Values part (Management Guideline H) of the Recreation section of Chapter 2 contains scenic value guidelines.

1. Coordinate timber harvest and road building plans to accommodate tourism activities that benefit from the improved access and/or regrowth from harvested areas.
2. Consider impacts on tourism activities when designing timber harvest areas and determining silvicultural methods.

D. Management of Sites.
Management of tourism sites will promote high quality recreation experiences, environmental quality, and safety.

E. Trails.
See the Trails section of this chapter.

F. Information and Education.
Interpretive signs, trails, and displays are encouraged. Development of interpretive facilities will be addressed within the Five-Year Schedule of Timber Sales or other public review process and development will be subject to available funding.

III. ACTIVITY SUMMARY
The only tourism activities now occurring within the boundaries of the State Forest are two or three dogsled operations and a few operators who take people boating on the Tanana River for wildlife sightseeing. No fee is required for commercial day use of the forest, and there are currently no leases or permits issued for tourism in the TVSF.

TRAILS

I. GOALS

A. Public Use Opportunities
Ensure continued opportunities for public use of important recreation, public access, and historic trails of regional and statewide significance.

B. Local Trails
Assist in establishing local trail systems that provide access to community recreation areas.

C. Trail Corridors
Protect or establish trail corridors to meet projected future use requirements and protect current use.

II. MANAGEMENT GUIDELINES

A. Special Trail Corridors
This category includes trails that require unusual widths or management practices because of historical significance or unique values. Management guidelines should be developed for such trails on a case-by-case basis. As a general policy, special trails will be protected by corridors generally wider than the 100-foot minimum trail buffer width (50 feet each side of centerline) established for trails of regional or statewide significance discussed below.

No trail corridors within the State Forest are currently designated in this category. If the Chena Hot Springs Winter Trail is relocated to within the State Forest, it will be designated as a special trail corridor. Designations of identified RS 2477 trails should be coordinated with the Division of Mining, Land and Water, Land Section, Northern Region.

B. Standard Trail Corridor of Regional or Statewide Significance
This category includes the majority of trails on state land. These trails generally provide foot, dogsled, horse, mountain bike, snowmachine, four-wheeler, and sometimes vehicle access for a variety of purposes. Most have a history of public use and can be expected to see increased use as the state's population increases. The following guidelines are intended to ensure consistent management practices on such trails throughout the state while allowing some flexibility to tailor management decisions to site-specific conditions.

Trails of regional or statewide significance within the State Forest shall be protected by corridors that have a minimum width of 100 feet (50 feet each side of centerline). This zone should be designed to protect the quality of the experience of the user and to

minimize negative effects such as noise or dust from adjacent land uses. Corridor widths may be increased to minimize land use conflicts, to protect the privacy of adjacent landowners, to separate motorized from nonmotorized uses, to allow future siting of public facilities, to allow flexibility for rerouting, or to adapt a trail to specific public uses or aesthetic or environmental concerns. Corridor widths may vary along the length of a trail because of the above considerations. However, in no case will the width of the corridor be less than 100 feet (50 feet each side of centerline). Corridors should be designed as the need arises in a Forest Land Use Plan or within the Fairbanks North Star Borough Comprehensive Recreational Trail Plan.

C. Land Use in Corridors

To the extent feasible and prudent, land use activities within a trail corridor, such as permits, leases, timber sales, and material sales, will be managed and permits and leases issued so that trail use or the aesthetic character of the trail are not adversely affected. This does not preclude trail crossings or rerouting of trails as described below.

D. Conversion of Trails into Roads

Trails that are classified in this plan into categories described by II.A. or II.B. above will be converted into roads only after consideration in the Five Year Schedule of Timber Sales and Forest Land Use Plans. The Division of Forestry will be invited to comment on RS 2477 route upgrade applications where they impact state forest lands. Division of Forestry should coordinate with the Division of Mining, Land and Water regarding proposals to upgrade or vacate RS 2477 routes and will include such proposals in the Five Year Schedule of Timber Sales and Forest Land Use Plans.

Upgrades initiated by parties for non-timber uses are exempt from inclusion in the Five Year Schedule of Timber Sales and Forest Land Use Plan processes, but would require an authorization from the DMLW (Division of Mining, Land and Water).

E. Conversion of Roads into Trails

A forest access road may be converted to a trail after its use as a road has terminated. The nature of the road may require that it be put-to-bed, thus the new "trail" may have water bars, removed culverts, grass seeding, or other measures to prevent erosion which other trails may not have. Roads will be converted into trails only after consideration in the Five Year Schedule of Timber Sales and Forest Land Use Plans. Any anticipated conversions should consider the Corps of Engineers' silvicultural exemption during the process.

F. Rerouting Trails

Rerouting of trails for a short distance may be permitted to minimize land use conflicts or to facilitate use of a trail if alternate routes provide opportunities similar to the original route. If trails are rerouted, provision should be made for construction of new trail segments if warranted by type of use. Rerouting of trails will be addressed in the Five Year Schedule of Timber Sales and Forest Land Use Plan processes.

G. Trail Crossings

When it is necessary for powerlines, pipelines, or roads to cross trail corridors, crossings should be at 90-degree angles when feasible. An exception is when a trail corridor is deliberately combined with a public utility or transportation corridor. Where feasible, vegetative screening should be preserved when a utility crosses a trail corridor.

H. Trail Use Restrictions

Before restrictions are put into place, DNR should attempt to resolve the problems through management actions. Existing and traditional use of trails will not be restricted unless DNR finds that overriding public concern requires restrictive use. Restrictions on the use of trails may be imposed in order to prevent damage to the trail. Such restriction may limit the types of trail traffic based on trail conditions or by season. Restrictions which are based on avoiding conflicts among different types of trail users will require a plan amendment and incompatibility finding specifying the trail and the restrictions.

Several statutes address restriction of uses (AS 41.17.200(b), AS 41.17.230(a), AS 38.05.300(a)), restrictions on easements and rights-of-way use (AS 38.04.058), and restrictions of traditional means of access (AS 38.04.200). Applicable statutes and regulations must be considered when contemplating use restrictions.

I. Management of Future Trails

Trails in the future may be constructed for specialized recreation, access, or multiple use. Alignment, standards, and management guidelines of such trails will be proposed and reviewed through a public review process.

III. ACTIVITY SUMMARY

Approximately 250 miles of trails have been designated to be of regional or statewide significance. These are listed in Table 11 and described in Chapter 3 of this plan.

No trail corridors are currently designated as special. As stated above, the Chena Hot Springs Winter Trail will be designated as such if it is relocated within Unit 6 of the State Forest.

Table 11. Trail corridors of regional or statewide significance.

Trail Name	Unit
Baker	1
Country	1
Fairbanks – Manley Hot Springs	1,2,4
Nenana	2
Dunbar – Livengood	3,4
Allen Creek – Dunbar	4
Keystone Ridge	4
Left Fork	4
Lincoln Creek	4
Martin – Dunbar	4
Cripple Creek – Rosie	5
Rosie Creek	5
Anaconda Creek	6
Flat Creek	6
Iowa Creek	6
Lyrad Creek	6
Jenny M. (East and West)	6
Smallwood Creek	6
Redmond Creek	7
Gilles Creek	7,8
Caribou Creek	8
Rosa Creek	8
Short Independent	8
Indian Creek	9
Prospect	9
Jolly's Cabin	9
Fortymile - Big Delta	9
Blue	10
George Lake	10
Goodpaster Historical	10
Sand Creek	10
Tanana Crossing Grundler	11,12
George	11
Michigan Creek	11
Eagle	12,14
Dennison Fork	13
Clearwater Creek	14

TRANSPORTATION

The Division of Forestry plans to bring the entire timberland base of the State Forest under active resource management. At current harvest levels it will take several rotations before all areas of the forest are brought under active management. Current rotation lengths vary from 80 years in the hardwoods to 120 years in the softwoods.

As all areas of the forest are brought into active management the transportation system will be expanded by using a variety of road systems. At some point in the future, all areas will have access via an all season or winter road system. Portions of the road system will be inactive or "put to bed" for long periods of time. Other portions will be maintained as primary access routes into the forest. Planning and route selection for this system will be incremental and will occur as timber sales or other resource management activities occur in different geographic regions of the forest. This transportation system will be integrated and coordinated with other major land-owners, private and public, to ensure an efficient and logical transportation system is developed.

I. GOALS

Develop a transportation system to implement this plan and integrate it with other transportation needs in the Tanana Basin.

A. Minimize Costs

Develop a transportation system that has the lowest possible long-range cost, including construction, operations, and maintenance. Avoid unnecessary duplication of transportation facilities.

B. Minimize Adverse Impacts

Develop a transportation system with minimal adverse impact on the environment, aesthetic and cultural features, and other users.

C. Promote Efficiency

Develop a transportation system through a process of efficient route planning and with consideration of the full range of access needs, such as access to approved developments, commercial timber, recreation, and for forest protection.

D. Ensure Public Safety

Develop a transportation system with a high standard of public safety.

E. Minimize Access Restrictions

Do not unduly restrict access to TVSF land and resources.

II. MANAGEMENT GUIDELINES

A. Identification of Potential Transportation Routes

Rivers and terrain influence the type of access that exists, and the type of access that will be constructed in the State Forest. Much of the State Forest is accessible only by winter

road due to the presence of wetlands and rivers. Descriptions of anticipated access for each management unit is found in Chapter 3. Due to changing economic conditions or the construction of roads for non-timber projects, access may change from what is described in Chapter 3.

The Tanana Basin Area Plan provides general recommendations for transportation routes necessary to support the land use policies in that plan, including some routes that cross the Tanana Valley State Forest. However, more detailed route alignment and feasibility analysis must be completed before the routes can be considered final.

To the extent feasible and prudent, DNR will avoid actions incompatible with the eventual construction of any potential transportation routes within the Tanana Valley State Forest that were identified in the Tanana Basin Area Plan until final decisions are made on the feasibility of these routes. The transportation routes that could potentially pass through the State Forest are the Alaska Natural Gas Pipeline, the Alaska Railroad Extension, the Prince William Sound - Upper Tanana Railroad Corridor, Western Access Railroad Corridor, and Nenana-Totchaket Area Access route. Descriptions of these routes are given in the Tanana Basin Area Plan.

B. Access Plans for Resource Development Projects

Access needs for forest management are described in Chapter 3 for each management unit, and are summarized in Table 12. However, access plans may change over time because of factors like access development for non-timber resources (e.g., minerals and oil and gas). Incremental development of forest roads is anticipated to occur throughout the State Forest. The rate will depend on demand for forest products and need for forest protection and other multiple use activities. Non-timber development projects may not be anticipated in this plan, but may be initiated in any part of the State Forest. Prior to the initiation of a resource development project, DNR will identify appropriate means of access and responsibilities for design, construction and maintenance of any proposed transportation facilities. Access plans for timber operations will be proposed to the public and other agencies through the Five Year Schedule of Timber Sales and Forest Land Use Plans. Access plans for other development activities will be coordinated through the applicable permitting processes.

C. Joint Use and Consolidation of Surface Access

Joint use and consolidation of surface access routes and facilities will be encouraged wherever it is feasible and prudent to do so. Roads will be constructed for the use and development of resources, and will be open to the public to allow for the use and development of resources except for closures noted in the Road Use Restrictions part of the Transportation section of this chapter. Surface access should be sited and designed to accommodate future development and avoid unnecessary duplication. Access plans should be coordinated with adjacent land owners to promote joint use and efficiency. The access needs of other users should also be considered. The feasibility of using an existing route or facility will be evaluated before the use of a new route or facility is authorized.

If a forest road is used by a limited group of people, such as for private land access, DNR will attempt to secure an agreement from the users for their share of the maintenance of the road to enable continued use of the road during periods when timber harvest is not occurring.

D. Protection of Hydrologic Systems
Transportation facilities will, to the extent feasible and prudent, be located to avoid effects on quality or quantity of adjacent surface water resources, or detract from recreational use of the waterway. Standards for road construction and associated facilities are described in 11 AAC 95.285-335.

1. Construction and maintenance of transportation improvements in 100-year flood zones in the Fairbanks North Star Borough will require a permit from FNSB as required by the National Flood Insurance Program.
2. During winter, snow ramps, ice bridges, or other methods shall be used to provide access across frozen rivers, lakes, and streams to avoid the cutting, eroding, or degrading of banks. Operationally, cutting of the banks may be required by site-specific conditions. If this technique is used, it must be approved via the Title 16 process. These facilities should be removed immediately after final use.
3. All transportation facility construction and maintenance shall comply with water quality standards of the State of Alaska.
4. All roads for forest operations shall comply with best management practices in the Forest Resources and Practices Regulations.

E. Protection of Fish and Wildlife Resources
Important fish and wildlife habitats, such as riparian areas, wildlife movement corridors, important wintering or calving areas, and threatened or endangered species habitat shall be avoided in siting transportation routes unless no other feasible and prudent alternatives exist. Location of routes and timing of construction and duration and conditions of use and permanence of roads shall be determined in consultation with the ADF&G.

G. Protection of Cultural Resources
Division of Forestry will consult with the Alaska State Office of History and Archaeology, which includes the State Historic Preservation Office, to avoid known historic and archeological sites during construction of transportation facilities.

H. Protection of Scenic Resources
Roads and other transportation facilities should be sited and designed to minimize impacts to scenic resources identified in Chapter 3. Statutes and regulations pertaining to aesthetic considerations include AS 38.04.200, AS 41.17.060(c)(6), and 11 AAC 95.820.

I. Timber Salvage From Rights-of-Way
All timber that has value for commercial or personal use should be salvaged on rights-of-way to be cleared for construction. See AS 41.17.083 regarding salvage and salvage value.

J. Material Sites
To minimize the construction and maintenance costs of transportation facilities, material sites should be located as near to material use as practicable. Transportation corridors that require material should be located with reference to material potential identified in the Tanana Valley State Forest Resource Analysis, Part III.

Material sites should be screened from roads, residential areas, recreational areas, and other areas of significant human use. Sufficient land should be allocated to the material site to allow for such screening. Rehabilitation of material sites shall meet the requirements of 11 AAC 97.250(a).

For additional guidelines that affect material extraction, see policies under the section on subsurface resources and the Forest Resources and Practices Regulations (11 AAC 95.325).

K. Off-Road Vehicle Activity
Most off-road vehicle activity does not require a permit on state forest lands. Under 11 AAC 96, using a motorized vehicle in the State Forest, including a four-wheel-drive vehicle, stock pickup truck, snowmobile, or all-terrain vehicle (wheeled or tracked), on or off an established road right-of-way, does not require a permit if use off the right-of-way does not kill or break through the plant cover and expose the soil to erosion. However, this policy does not apply to state land managed by other state agencies, such as lands within the limits of ordinary high water of cataloged anadromous waters. Through a Special Use Lands designation, off-road vehicle activity may be restricted in research natural areas and in the Bonanza Creek Experimental Forest if this use threatens the purposes for which these areas were established (see the Scientific Resources section of this chapter).

When permits are issued for off-road vehicle use under 11 AAC 96 or on special use lands, they will require that disturbance of soils, vegetation, fish and wildlife populations, drainage patterns, and water quality be minimized. Operations should be scheduled when adequate snow and ground frost are available to protect the ground surface, or should require the use of low ground pressure vehicles, avoidance of problem areas, or other techniques to protect areas likely to be damaged (see the Management Guidelines part of the Water Resources section of this chapter). Before issuing permits, DNR will consult with affected agencies.

In addition, off-road vehicle permits generally should not be given for vehicle use in important fish and wildlife habitats during sensitive periods. If such vehicle activity is essential and no other practical alternative exists, it should be allowed only as an occasional use. ADF&G will be consulted to help identify important fish and wildlife habitat areas and sensitive periods that might warrant this restriction.

Several statutes address restriction of uses (AS 41.17.200(b), AS 41.17.230(a), and AS 38.05.300(a)), restrictions on easements and rights-of-way use (AS 38.04.058), and

restrictions of traditional means of access (AS 38.04.200). These and subsequent statutes and regulations shall be considered when contemplating use restrictions.

L. Siting Utilities
Utilities and other support facilities, including but not limited to generation and transmission structures or cables and buried sewage and water lines, will be sited to minimize adverse impacts to other valuable resources or uses.

M. Forest Road Construction and Maintenance Standards
A mixture of all-season, winter, and spur roads should be planned appropriately for their intended use and to minimize adverse environmental impacts, including impacts on wildlife habitat and riparian areas. The Forest Resources and Practices Act (AS 41.17.010-.900) specifies measures required for environmental protection. The Forest Resources and Practices Regulations (11 AAC 95) contain road construction and maintenance standards. The Northern Region forest road standards are in Appendix F.

N. Other Design Standards
Bridges greater than 20 feet in length will be approved by Alaska Department of Transportation and Public Facilities. Roads crossing fish-bearing waters will provide fish passage consistent with AS 16.05.840, and those crossing cataloged anadromous waters, with AS 16.05.870.

O. Road Use Restrictions
Forest roads may be closed temporarily or seasonally for public safety or to protect the road surface from damage. Road use may be restricted temporarily to minimize hazards that result from conflicting use, such as during periods of active industrial use.

Access restrictions shall comply with AS 41.17.200(b), AS 41.17.230(a), AS 38.05.300(a), AS 38.04.058, and AS 38.04.200 and other applicable statutes. Access restrictions for reasons other than protecting the resource or providing for public safety will require a finding of incompatibility.

Forest roads and bridges will be closed permanently when resources are not available to maintain them to the standards listed in Appendix F or when continued use is likely to produce significant negative impact on resources within the forest. Where roads are closed, DNR will take measures for erosion control in accordance with the Forest Resources and Practices Regulations (11 AAC 95.320).

Forest roads should remain open if they access substantial timber or other public resources. When known, decisions regarding permanent road closure and continued maintenance will be reviewed by agencies and the public in the Five Year Schedule of Timber Sales planning process as detailed in Chapter 4, and in the Forest Land Use Plans for specific timber sales.

Several statutes address restriction of uses (AS 41.17.200(b), AS 41.17.230(a), AS 38.05.300(a)), restrictions on easements and rights-of-way use (AS 38.04.058)), and

restrictions of traditional means of access (AS 38.04.200). These and subsequent statutes and regulations shall be considered when contemplating use restrictions.

P. Winter Roads

Winter roads are roads that can normally support regular logging vehicle traffic only during winter months and that have a load bearing capacity derived from a combination of frost, snow, or ice (11 AAC 95.900(90)). Construction techniques for winter access routes depend on the range of terrain encountered, and may include clearing vegetation and ground cover needed to provide a level running surface. Road surfaces may be composed of frozen mineral soil, packed snow, ice, or surface organics. 11 AAC 95.290(f) and (g) address winter road construction and design. Some segments of winter roads may cross terrain that requires construction to all-season standards.

Winter roads will be constructed and maintained to minimize degradation to vegetation, substrate, and hydrology. In all cases, winter road construction will protect water quality by adherence to standards established in the Forest Resources and Practices Regulations (11 AAC 95).

III. ACTIVITY SUMMARY

Access now exists to much of the TVSF, via state highways, RS-2477 trails and winter trails. In the future, forest roads may access all units of the forest. However, it is unlikely that all units will contain maintained roads simultaneously. In general, units adjacent to state highways are expected to contain all-season roads, to provide a range of access opportunities to the State Forest throughout the year. At present, there are over three hundred miles of all-season roads accessing the state forest. Much of the forest is expected to have only winter access. State forest logging roads and trails provide the majority of off-highway all-season access to public lands in the valley.

Table 12. Primary access by subunit of the Tanana Valley State Forest.

AREA OFFICE	ALL SEASON ACCESS	ANTICIPATED ALL SEASON ACCESS	WINTER ONLY ACCESS
FAIRBANKS	Subunits 4C, 4D, 5A, east ½ of Unit 6, and the Mosquito Creek and Canyon Creek Road portion of Subunit 7B.	Unit 3, and Subunit 4A.	Unit 1A, Southeast portion of Tatalina in Subunit 4B, west ½ of Unit 6, Subunit 7A, and remainder of 7B, 7C not in all-season access.
KANTISHNA	None.	None.	Subunits 1A, 1B, 1C, 2A, 2B, 2C, 2D, and 2E.
DELTA	Subunit 8A and 10C south of the Tanana River.	Subunits 8C, 8D, 9A, and 9C.	Subunits 10A, 10C north of the Tanana River, Subunit 10D, and Unit 11.
TOK	Unit 14 and portions of 13B.	Portions of 12B and 13B.	Subunits 10C, 12A, 12B, 13A, 13B, and Unit 14 south of the Tok River valley.

WATER RESOURCES

I. GOAL

A. Protect Wetland Values

Protect the hydrologic, habitat, and recreational values of public wetlands. Land management practices will be directed at avoiding or minimizing adverse impacts on the following important functions of wetlands:

- Wetlands filter nutrients and sediment from upland runoff.
- Wetlands serve to stabilize water supplies by storing excessive water during flooding and by recharging groundwater during dry periods.
- Wetlands provide important feeding, rearing, nesting, and breeding grounds for many species; related recreational use and aesthetic values are also important.

B. Protect Water Quality

The Alaska Forest Resources and Practices Act (AS 41.17) is designed to protect water quality and ensure that forest operations meet state and federal water quality standards. The regulations for the Act (11 AAC 95) establish best management practices that must be used when designing and implementing forest operations. All management activities shall be conducted in compliance with Alaska Water Quality Standards (8 AAC 70).

II. MANAGEMENT GUIDELINES

A. Definition of Wetlands

For purposes of state inventory and regulation of wetlands, DNR will use the wetlands definition adopted by the State of Alaska under the regulations of the Coastal Management Program (6 AAC 80.900(19)):

> Freshwater wetlands means those environments characterized by rooted vegetation that is partially submerged continuously or periodically by surface freshwater with less than .5 parts per thousand salt content and not exceeding three meters in depth.

B. Approval of Activities in State-owned Wetlands and Wetland Setbacks

Activities such as establishing trails or issuing leases shall be considered on an individual basis. These activities will be permitted if it is determined that the proposed activity will not cause significant adverse impacts to important fish and wildlife habitat or important ecological processes, or that no feasible and prudent alternative exists. Where it is not feasible and prudent to avoid such activities, other mitigative measures will be considered to meet the intent of this guideline.

C. Dredge and Fill Permits in Wetlands

Permits for dredging and filling in wetlands, including permits for gravel extraction, mining, and the construction of roads and pads, are regulated by the Corps of Engineers.

D. Operation of Heavy Equipment in Wetlands

Permits issued for activities that require the use of heavy equipment in wetlands that have important hydrologic, recreation, or habitat values will, to the extent feasible and prudent, require that damage to wetlands and wetland vegetation be avoided. Winter access only should be used in or across wetlands whenever feasible. DNR will consult with other affected agencies before such permits are issued.

E. Setbacks

Where feasible and prudent, setbacks should be made between commercial and industrial uses, transportation facilities and pipelines, and adjacent waterbodies unless these uses are water dependent. The width of this setback may vary depending on the type and size of the use, but will be adequate to maintain public access to riparian areas and protect water quality in accordance with water quality standards established by the Department of Environmental Conservation. For nonwater-dependent uses allowed adjacent to designated anadromous fish waters, this setback, to the extent feasible and prudent, will be a minimum of 100 feet landward of the ordinary high water mark.

Where it is not feasible and prudent to maintain a setback adjacent to fish habitat, public water supplies, or recreational waters, other measures will be implemented to meet the intent of this guideline.

Wetland buffers will be increased from the standards set (above) if necessary because of the potential for adverse impacts on wetlands from development on adjacent lands. If, for instance, surrounding lands are steep and have high erosion potential or the proposed use poses a high risk to water quality or other values, buffer widths will be increased accordingly. When steep conditions exist, buffer widths should be increased as follows:

If a 10 to 40 percent slope exists, then the buffer width should increase 25 percent;

If the slope exceeds 40 percent, then the buffer width should increase 50 percent.

Note that these measurements are horizontal distance.